

FOOD DIGEST

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RAW MATERIALS

1 Cultivation of edible mushroom

RRL, Jorhat, has started experimental cultivation of some of the edible varieties of mushroom. Compost of paddy straw, spent Java citronella grass and banana leaf were tried for growing winter species whereas water hyacinth and paddy straw were used for summer species, in view of introducing new composts other than conventional substrates (paddy straw) used in commercial cultivation. It is observed that apart from paddy straw, spent up citronella grass also could be used profitably in case of winter species of mushroom. The results obtained with water hyacinth as bed material for summer crop are encouraging. The studies reveal that there is good scope for cultivation of mushroom in the region.

(Research and Industry 26(1); 1981; 59-60)

2 Fruit concentrates

A number of varieties of some common fruits suitable for processing industries have been identified. The fruit selection is particularly ideal for beverage industry. If marketed on a large scale, a bottle of the fruit product is estimated to cost only 60 paise which is much cheaper than any of the synthetic drinks.

Among peaches, 'Sharbati' variety was found to be the best for making the concentrate. It has a good flavour and has a great potential in the processing industry. In Ber (gooseberry) varieties, the popular 'Gola' has been found to be the best. An excellent ready-to-serve drink can be prepared from the fruit.

Among various varieties tested in Guava, 'Banarasi Surkha' and 'Lucknow-49' (Sardar) were found better for the ready-to-serve drink and as a preparation of the concentrate. In grapes, 'Beauty Seedless' and 'Early Muscat' were found highly suitable for a concentrate.

(PTI Science Service 1(4); 1981)

STORAGE AND INFESTATION CONTROL

Cheap potato storage device

A simple and cheap technique for short-term non-refrigerated storage of potatoes on the plains has been developed.

Named as Evaporative Cooling System, the new technique did not involve direct energy input, chemicals or running cost. As against the cost of Rs. 2,400 per tonne of capacity for a cold store, it was only Rs. 750 for the new system.

The 40 tonne evaporative cooling experimental store, set up by the Institute at Jullunder, has yielded satisfactory results.

A double-wall construction with rice husk insulation, the store has no windows. There are, however, ventilators, the outer openings of which are covered with chicken wire mesh. A thick layer of packed wood wool behind the wire mesh is continuously moistened by dripping water from a pipe running along the top of the ventilators.

The asbestos ceiling has small holes to allow hot air in the room to rise to the space between the ceiling and the roof where it escapes through an exhaust fan.

The solar heating of the roof sets up a draught which pulls outside air into the store through the ventilators. As a result the air is evaporatively cooled.

(Hindustan Times December 7, 1981; 23)

Technique for keeping eggs fresh

A technique for preventing the loss of freshness in raw eggs during distribution by using carbon dioxide has been developed and patented.

Theoretically, eggs lose their freshness because the carbon dioxide contained in them gradually evaporates through pores in their shells. This causes their pH to rise while turning condensed albumen into watery albumen. To prevent this, methods of coating individual eggs with oil or refrigerated transportation have been used. Since these methods require much labour and involve condensation on eggs, it has been expensive for egg dealers to keep eggs fresh.

The new method leaves egg shipments in 30-60% carbon dioxide for 6-12 hours to allow carbon dioxide to dissolve into the eggs through their shells. This retards the rate at which condensed albumen turns watery, thus keeping eggs fresh longer. It has been proved that eggs processed by this method maintain a haugh unit of more than 60 after 7 days in the summer. In U.S.A., eggs with haugh unit of 55 or over are standardized as 'A' quality.

(Technology Awareness Service 6(3); 1980; 57)

5 Carbon dioxide for meat storage

A cheap and simple method which could increase the storage life of meat without recourse to freezing has been developed at the Swedish Meat Research Institute. The method provides for fresh meat to be exposed to 100 per cent carbon dioxide in packagings, containers or store. This cheap gas greatly inhibits the spread of harmful bacteria while having no effect on beneficial lactic acid bacteria. One minor drawback is that the meat takes on a greyish colour but this vanishes when it is once more exposed to oxygen.

The method allows the storage life of fresh meat to be extended fivefold, it is stated, but a much greater prolongation can be obtained by raising the pressure to five atmospheres. In this manner fresh pork could be stored without deterioration for 120 days as against the usual 10 days.

The methods - the principle of which has been known for a century - has aroused considerable interest on the part of meat exporters in the USA, Australia, and New Zealand.

(PTI Science Service. 1(2); 1981)

6 Insecticide controls more than 40 insects

Fairfield American Corporation has announced availability of the newest addition to its growing family of Pyrethrin-based insecticide formulations; Pyrenone M.A.G.C. 5 - 1 designed for use undiluted in ULV equipment, this Mechanical Aerosol Generation Concentrate may also be applied using conventional fogging or spraying equipment when diluted in oil.

Quick-acting M.A.G.C. 5-1 is effective in space and contact applications in the control of more than 40 insect pests found in 39 locations, both indoors and out such as mushroom production plants, granaries, bakeries, meat packing plants, beverage plants, restaurants, hotels, office buildings, truck trailers, and so on.

Especially recommended for use in food processing, storage and serving areas, economically M.A.G.C. 5-1 may be applied as a wet spray without interrupting food processing operations.

(*Food in Canada* 41(2); 1981; 42-43)

FOOD ADDITIVES

Low-cost cheese flavours

Snack food manufacturers seeking low-cost formulation ingredients find dehydrated flavours possible flavour alternatives to cheese. A reduction of 25-50% cheese solids is possible with 1 lb Spectra TM replacing 6-20 lb cheese. Sweet/acid whey solids, butter milk/skim milk solids or hydrogenated vegetable oil can be used to compensate for solids lost. A cost comparison was made with cheese oil coatings for cheese curls. Controls containing 15% cheese powder were compared to products formulated with Spectra replacing 25% cheese powder. Substitutes exhibited cost savings of 4 cents/lb compared to the control. In sensory evaluation tests, the Spectra-flavoured cheese curls were preferred.

(*Indian Dairyman* 33(6); 1981; 403)

New lemon flavour

Firmenich has introduced a new natural and artificial lemon flavor especially recommended for noncarbonated beverages and candy. Tests conducted by the company resulted in unusually high consumer acceptance. Samples in liquid and powder form, with technical information are available.

(*Food in Canada*. 41(1); 1981; 53)

9 Soy protein isolate

Soy protein isolate called Profam S-970 enhances the texture and final appearance of processed seafoods such as deboned fish and shellfish flesh. The binding and thermal stable gel forming characteristics of the product provide cold formed seafood shapes with physical stability required during mechanical transport from the extruder/shaping head through the batter/breading and deep fat frying steps. It also prevents water loss and breading disruption during deep fat frying. Profam S-970 features a bland flavour and creamy white colour which reportedly blend well with the natural seafood flavour and colour. The product may be used alone or in combination with rice flour for high pressure/temperature texturization.

(*Food Technology* 35(3); 1981; 100-101)

10 Keeps salads fresh

Processes involved in the production of fresh salads will find a new product from Cardinal Kitchens of interest. Called Crisp'n Fresh, this ingredient extends the shelf life of those highly perishable products when combined with tap water.

Crisp'n fresh prevents enzymatic browning, acts as a freshening agent and reduces microbial activity in prepared fresh fruits and vegetables. It does not impart colour, odour or flavour, when treated with Crisp'n Fresh, prepared fresh fruits and vegetables show no discolouration or loss of crispness after standing in air for several hours.

(*Food in Canada* 41(6); 1981; 41)

11 Liquid bread shortening

Durkee Industrial Foods Group/SCM Corporation now offers B-40, a high stability liquid bread shortening B-40 is an all-vegetable shortening designed for continuous and batch process bread production. The high stability provides bakers with a product that resists rancidity and extends shelf life, as compared to other commercially available fluid shortenings.

Some of the advantages of using this product are: (1) it is labour-saving as it can be pumped and metered, eliminating weighing, manual handling and melting down; (2) reduces error by eliminating scaling of emulsifier and flakes; (3) B-40 produces bread that is comparable or better than that obtained with the conventional mixture of fat, emulsifier and flakes with respect to softness, ease of slicing, texture, shelf life and eating qualities; and (4) it eliminates the need for storing, opening and emptying emulsifier and flake containers, as well as disposing of them.

(*Food in Canada* 41(1); 1981; 52)

2 Cocoa substitute

A remarkable material has been developed from a high protein powder which is processed from cottonseed at the Miloumor plant in Haifa. Miloumor originally marketed the substance as a cocoa extender, recommending that the extender could replace up to 30 per cent of the cocoa in chocolate. But an American firm has successfully developed a product that is said to look and taste like chocolate, yet contains no cocoa.

Cottonseed, like the soyabean, is a relatively cheap, high-protein material which has no after-taste or smell, and so can be given any flavour or aroma. It contains a toxic substance, gossypol, which must be removed before it is fit for human consumption.

(*Coffee & Cocoa International* 8(1); 1981; 46)

3 Flavouring agent deemed carcinogenic

Cinnamyl anthranilate, a widely used synthetic flavouring agent, causes cancer in mice and rats, according to the National Cancer Institute's carcinogenesis testing program. The animals received the agent in their feed, at doses of either 30,000 or 15,000 ppm. Of mice receiving the higher dose, 79% of the males and 67% of the females developed malignant tumors, primarily of the liver. For mice receiving the lower dose 60% of the males and 41% of the females developed malignant tumors. Though female rats receiving the agent did not develop tumors, about 15% of the male rats receiving the higher dose of Cinnamyl anthranilate developed tumors either in the kidney or in

the pancreas. The agent, used since the 1940's to impart either a grape or cherry flavour, is added to foods, including beverages, candy, baked goods, puddings, and chewing gums. It is generally used in concentrations below 1000 ppm in such foods.

(*Chemical & Engineering News* 59(1); 1981; 21)

PROCESSES

14 ✓ Concentrated milk by ultrafiltration

Concentration of skim and whole milk by ultrafiltration has been found to be technically feasible and is fast emerging as an inexpensive unit operation compared to the conventional freezing and evaporation process in dairy industries.

Ultrafiltration is already being used for whey processing and cheese making but comparatively less interest has been shown to processing of whole milk and skim milk.

Apart from the advantages like better yield of the product and lower production costs got by conventional methods, this process has additional benefits like requirement of limited floor space, high degree of automation and continuous production and good sanitary standards.

Using cellulose acetate membranes in ultrafiltration experiments, researchers at the Central Salt and Marine Chemicals Research Institute, Bhavnagar were able to concentrate protein and fat about four times in whole milk. The recovery of fat and protein in these two products was found to be 100 per cent and 92 per cent respectively.

These experiments, the researchers say warrant further pilot plant studies to evaluate the economics of the process.

(*PTI Science Service* 1(2); 1981)

15 Combination of soya and cow milk

By numerous experiments an optimal method was evolved for manufacture of a cultured product containing soya milk and cows' milk. The soya beans are first soaked in water at 40-50 C for 18-20 hours, with addition of $(\text{NH}_4)_2\text{CO}_3$ to extract unwanted carbohydrates etc. The husked soya is then mixed 1 : 5 or 1 : 7 with water or whey and, after

grinding, it is filtered or centrifuged. The soya milk so obtained is pasteurized for 5-8 minutes at 95-100 C and cooled to 8 - 10 C. It is then mixed 1 : 1 or 2 : 1 with yoghurt which is obtained from cows' whole or skim milk by standard methods, with incubation to 200-210 T acidity. The 1:1 mixture contains 2.5-3% fat and 3.8-4.2% protein (the protein content being 0.2-0.3% higher if whey is used). The 2:1 mixture (soya milk + cows' skim milk) is rich in phospholipids and contains no cholesterol and only 1% lactose. The products are considered suitable for patients with diabetes, allergies, etc.

Initial attempts to incubate the soya milk or a soya/cows' milk mixture, using *Lactobacillus acidophilus* + *Str. plantarum* or *L. bulgaricus* + *Str. thermophilus*, had been unsuccessful because of problems with flavour and consistency.

(*Indian Dairyman* 33(8); 1981; 519-520)

16 Honey milk

Honey milk is produced by heating raw milk to 138 C in a continuous heater with holding for approx. 10s, cooling to approx. 20 C, and further heating to 80 C. 14% bees honey is then added, the mixture is homogenized in a high-pressure homogenizer at 120 bar, heated to 138 C, cooled to 20 C and aseptically bottled.

(*Indian Dairyman* 33(8); 1981; 520)

17 Higher cellulose to glucose conversion by acid hydrolysis

A modified acid hydrolysis process developed at the Georgia Institute of Technology, USA, promises to yield cellulose to glucose conversion rates as high 80% as against 55% from conventional dilute acid hydrolysis.

The GIT process is a modified form of the conventional process. The process begins with pretreatment by steam explosion. In this stage, wood chips are stripped of lignin, which is removed in several washes and then burnt for process energy. Volatile by-products include furfural, acetic acid, methanol and formic acid, which are recovered.

The delignified wood then passes into the hydrolysis unit. After being slurried with sulphuric acid and dewatered to 30% solids, the feed-stock is fed into a "Stake Technology" continuous digester for

hydrolysis with dilute sulphuric acid. Temperatures are high. Reaction time is short.

The product is filtered, washed and pressed to separate sugars from unreacted cellulose, which is recycled to the reactor. Vapours are condensed and sent to the furfural recovery plant. The sugar solution, which contains about 13% hexoses, is neutralised and fermented to ethanol. The ethanol fermentation process is a two-stage fermenter operates aerobically to facilitate yeast growth, while the second stage is anaerobic.

The product is 6 or 7% ethanol solution plus carbon dioxide. The yeast can be recycled. Residence time is 6 hours.

Ethanol yields are expected to be about 285 litre/ton of hardwood and 345 litre/ton of soft wood. GIT hopes to set up a 3 ton/day pilot plant by 1982 to confirm these figures.

(RCTT Technical Digest 2(4); 1981; 4)

18 Removing poison from groundnut oil

Groundnut oil has been a popular vegetable oil because it is prevalently consumed in the raw form which retains a favourable odour. This odour will be lost through purification.

TISTR's research has shown that the groundnut seed contains aflatoxin generated from a fungus known as *Aspergillus flavus*. In humid tropical countries, such fungus grows rapidly. Furthermore, the aflatoxin is highly poisonous and affects the growth of soft tissues in human organs.

Chemical solvent does not as efficiently remove the aflatoxin as it does the natural groundnut odour. Irradiation is expensive.

Recently TISTR developed a simple yet effective way of eradicating the aflatoxin by using soil to absorb the toxin. Using basic easily available tools and equipment, the procedure does not cost more than 50 Baht/ton of groundnut.

(Technonet Asia Digest July 1981)

BYPRODUCTS AND WASTE UTILIZATION

9 Waste fish made edible

The Central Institute of Fisheries Technology, Cochin, has developed several techniques for manufacturing readily consumable products from fishes, hitherto considered a waste.

A method has been standardised for production of frozen fillets, for export and internal trade from poor quality fishes like catfish, jawfish, thread-fin-bream Indian halibut. This is likely to generate more income and employment for poor fishermen as the operations involved in the technique are mainly manual.

Attempts are being made for the utilisation of squilla, a shellfish, which were hitherto considered a waste. Some methods have been worked out for extracting proteins and soluble nonprotein nitrogen fractions.

A ready-to-serve product to be used as bread-spread has been prepared from Bombay-duck paste. A process for canning this paste has also been perfected.

Preparation of smoked products from fillets of razor-edge fish has been successfully attempted at the Institute. The products have very good appearance and taste. Salted and smoked products have also been prepared from silver-bar fish. Minced meat of these fishes is utilised for making frozen blocks as well as other products.

Processes have been standardised for production of dried mussel meat and other light-smoked and dried products from mussels. Suitable processes have also been evolved for commercial production of cooked and frozen crab meat, and cooked, peeled and frozen prawns, conforming to international standards. The shelf-life of the frozen Indian oil sardine can be enhanced to nine months by selecting very fresh raw material and storing it at -20 C. This finding is expected to dispel the wrong notion that oil-sardine, even when frozen, has a shelf-life of only two to three months.

Attempts are being made to minimise the spoilage losses during transportation of fish from production centres to consuming areas. Optimum conditions of icing, packing, freezing and other parameters of fish transport by rail, trucks and carrier boats have been worked out.

Special efforts are being made to popularise the use of second-hand tea-chests insulated with polythene-lined thermocole for use as fish containers during transportation. The efficiency of such a container has been proved under rigorous conditions.

(PTI Science Service 1(2); 1981)

20 Molasses from orange refuses

A new technique is under development to produce molasses from juice-extracted mandarin orange refuses in Japan jointly by Ajinomoto Co. and the Saga Prefecture Horticultural Cooperative Association in the southern island of Shikoku. This new technique should be of considerable interest to India where quite large quantities of oranges which are sweeter than the Japanese mandarin oranges are grown but where the refuses, either after the extraction of juice or otherwise, are just thrown away by and large.

The new technology is expected to help the association to save energy costs by some 40 per cent and generate profits of about 34 million yen (Rs. 10 lakhs) annually.

(The Hindu December 21, 1980; p6)

PROCESSED PRODUCTS

21 Cereal-soy weaning food

A simple method has been developed for preparing cereal-soy weaning foods with high nutritive value. Soybeans are boiled, then ground and blended with cereal flours, such as corn or rice, and finally drum dried.

Whole soybeans are first blanched by being dropped directly into 5-10 volumes of boiling water and boiled for 20 minutes. This step prevents formation of the painty flavour often associated with soy products. This off-flavour is formed when damaged or ground soybeans are mixed with cold or warm water.

The blanched soybeans are ground and mixed with the desired cereal flour to form a thick slurry. The choice of cereal and the cereal to soy ratio will depend on local preferences and cost. From a nutritional standpoint, a ratio of seven parts of cereal to three parts of soy is preferred. However, for rice and corn (maize), the mouthfeel

(Texture), colour, flavour, and cost were improved by using a ratio of eight parts cereal to two parts of soy. This blend contains about 15 g protein and 340 calories per 100 g product. The PER is about 2.3

Both texture and flavour can be much improved by adding 0.05% baking soda (NaHCO_3) to the water used to blend the cereal and soy. Levels higher than 0.05% should not be used because a mild "soapy" off-flavour will develop during the drying process. Heating the slurry to about 65 C (150 F) before drying results in a softer, smoother product. Heating also thickens the slurry, making it easier to dry and reconstitute as a weaning food.

(Protein Foods and Nutritional Development Association of India Newsletter No. 41; 1981)

22 Manufacture of Biolakt

Biolakt, a product for feeding young infants, has been produced on an industrial scale at the Frunze Dairy Combine, USSR, since 1976. The process involves homogenization of fat-standardized sweetened milk, pasteurization at 90-92 C with 15 minutes holding, cooling to 36-38 C and incubation at this temperature for 4-5 with 2% of a special starter composed of acidophilus bacteria isolated from intestinal tract of breast-fed infants and possessing marked antibiotic and proteolytic properties and limited acidifying capacity. When acidity of the coagulated milk attains 70 T, stirring is initiated with concurrent cooling to 20 C, and the product is then filled into 250 ml paper packages which are subsequently transferred to cold stores for further cooling and storage. The finished product with an acidity of 80-105 T contains 3.2% fat, > 4.0% sucrose and keeps for 24 hour. It has a uniform consistency resembling that of cultured cream, and a clean lactic flavour with limited sweetness. Expansion of Biolakt manufacture to other dairy factories is planned and work is in progress on the development of Biolakt-2 (a variant enriched with trace elements and vitamins).

(Indian Dairyman 33(6); 1981; 403)

23 New cultured milk product

A new product known as VITA cultured milk is now being made experimentally at dairies in Sofia, Plovdiv, Varna and Burgas (Bulgaria). The milk is cultured with 4 specially developed strains of *Lactobacillus bulgaricus* which have different patterns of proteolytic activity and produce more free amino acids (up to 80 µg%) than traditional Bulgarian yoghurt cultures. When the cultured milk is fed to young infants, *L. bulgaricus* counts in the intestine rise to 950 million/g faeces, inhibiting potential pathogens such as *Proteus* and *Klebsiella* spp. The *L. bulgaricus* strains persist longer in the intestinal tract than *L. acidophilus* (14 vs. 3 days), and intestinal counts of *L. bulgaricus* are not reduced by treatment with antibiotics. It is also claimed that the new product, which is made in 2 variants (liquid and dried), has beneficial effect on patients with leukosis, anaemia, gastro-intestinal disorders and other complaints. The liquid variant has a soft creamy consistency, 90-95 T acidity and a storage life of 1 month at +4 C, it contains up to 9500 million viable cells/ml. The other variant can be spray-dried or freeze-dried, with $\leq$ 450 million viable cells/g. It has a storage life of 3 months under normal conditions and 1 year under refrigeration.

{*Indian Dairyman* 33(8); 1981; 519}

24 Vegetable protein from grass

A research group at the Faculty of Agriculture, Nagoya University, Japan, has experimentally produced vegetable proteins from pasture grasses, such as, clover and alfalfa. A demonstration experimental plant has been set up to produce protein and food from grasses. It is stated that the protein yields are at the moment about 0.3% of total grass weight. It is estimated that Japan imports about 650,000 tonnes of vegetable protein per annum.

(*Chemical Times* 31 Aug. 1981; 5)

25 Peanut alternatives

Alternatives to peanuts called Crunches may be used in ice cream and other dessert products, donuts and bakery foods, candy and snack foods. Crunches reportedly have an excellent taste and mouthfeel and

they have a longer shelf life and cost less than peanuts. When used in bakery dough or as a topping, they do not break or as a topping they do not break down under oven heat. Crunches are a caramelized, granulated blend of sugar, various nuts, vegetable oil, artificial flavourings, and salt. A series of 8 crunches are available.

(*Food Technology* 35(2); 1981; 104)

26 Chocolates and beauty masks from fish protein

Not only the Federal Republic of Germany, but also almost all countries processing marine products, are interested in a patent, which has been drawn up by two Polish engineers and has been applied for already in 15 countries: The Poles have developed from fish, which are not suitable for consumption, a high value protein concentrate, which can be used as an additive for meat, sausages, ham and hamburgers. Bakers and confectioners can produce chocolates and dietetic foods from this, and it can be processed also to make beauty masks, as reported from Poland.

The Polish engineers washed out the fish raw material by a special process, until the protein was dissolved and present in high concentration. The product, so obtained, offers several advantages; it can be stored at a temperature of 25 C without any loss in quality, and can be obtained from fish of low commercial value.

The scientists of the Centre for Protein Research in Gdingen have tested their so called HPM (=high protein content) as an additive for different products and found it to be good. Even the Federal Republic of Germany, the USA, Iceland, Italy, Norway, and Japan are reported to have shown keen interest in utilizing this patent as reported in the technical journal 'Industrias Pesqueras'.

(*Riechstoffe Aromen - Kosmetika* 31(2); 1981; 58)

EQUIPMENT AND MACHINERY

27 Coconut husking machine

This coconut husking machine (Fig. 1) works on the principle of three spring-action blades piercing the coconut husk vertically downward. The machine consists of a telescopic lever (1), a smaller lever

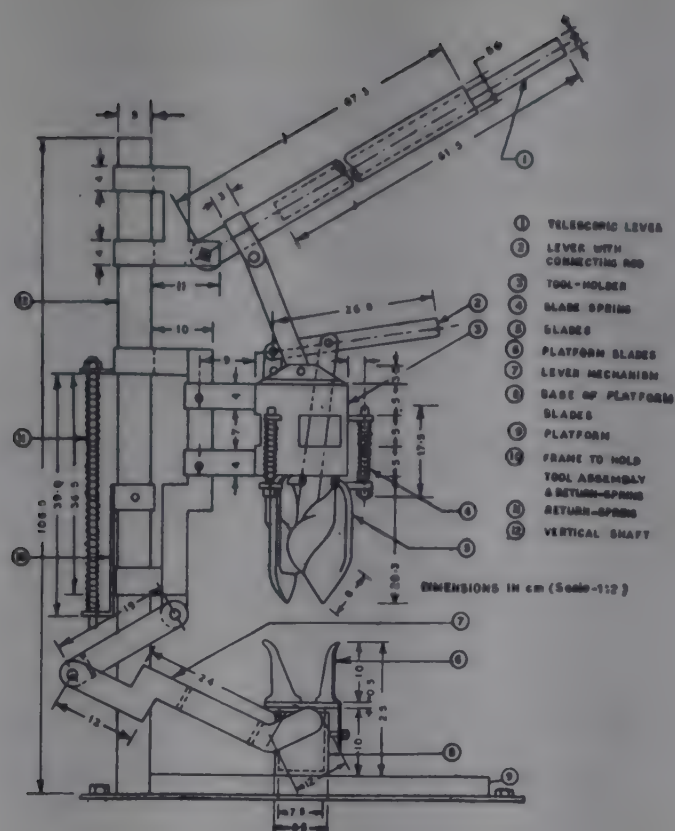


Fig. 1. The coconut husking machine

with central rod (2), a tool-holder (3), blade-springs (4), blades (5), platform blades (6), a lever-mechanism (7), the base of platform blades (8), the platform (9), a frame to hold the blade assembly (10), a return spring (11) and a vertical shaft (12).

The coconut to be husked is put on the platform in the correct vertical position, with its embryonic end upward and the ridges in alignment with the spring blades. The blade assembly is then brought down on the coconut with the help of the telescopic lever; simultaneously, the coconut also moves vertically upwards with the help of the lever mechanism. As the blade assembly is pressed further down, piercing the coconut husk, the spring-action blades come in contact with the hard shell, and they expand in the horizontal plane. The platform blades also pierce the husk from the lower side of the coconut. The blades are so shaped that as they expand, the different sections of the coconut husk are automatically twisted and thus detached from the shell. The lever is then lifted up leaving the loosened husk on the platform, which is removed by hand.

Some times, the loosened husk-nut is gripped by the blades in the toolholder, which is pressed down by the smaller central lever to

take out the nut; the loosened husk is then peeled off by hand easily.

A man could husk about 140 coconuts per hour with this machine, which was almost at par with traditional manual husking. However, it was observed that the heart-beat rate of the machine operator varied from 5,700 to 8,700 per hour, while that of the manual worker using the spike varied from 6,120 to 9,600 per hour - which obviously meant the latter has to exert much more than the former.

The cost of fabrication of the machine, including cost of materials, works out to Rs. 210. Its anticipated life is 10 years. The cost of the machine could be further brought down by large scale production.

The cost of husking with the machine works out to Re 0.79 per 100 coconuts (Rs. 1.10/hr) as compared to Rs. 1.08 per 100 coconuts (Rs. 1.51/hr) with the traditional spike. The reduction in the cost of husking is mainly attributable to the replacement of skilled labour by unskilled labour.

(*Invention Intelligence* 16(2); 1981; 80-81)

28 De-stoning equipment

The Peter Holland Group are marketing a de-stoner for the separation of stones, sand and similar foreign bodies from all root vegetables. The unit consists of a large water-filled reception tank with a specially shaped end, which when combined with a screw, creates vortex or whirlpool area centrally located below the raised entry to the product discharge elevator.

To reach the discharge elevator the product must be lifted away from the floor and sides of the tank - few stones are lifted in this way. Stones which do are forced centrifugally towards the outer casing by this whirlpool action, while heavier and larger stones carried forward by the product bulk settle on to the spinning stone grate situated below the entry to the discharge elevator.

On entering the washing section, the product is picked up by the circular flow of water created by the vortex action near to the discharge elevator. This creates a vigorous, turbulent washing sequence which is assisted by product-to-product contact as the speed of movement increases towards the centre of the vortex. Finally, the vegetable

is picked up by the bottom scoop of the discharge elevator and rolled and tumbled up an inclined screw, which helps to remove any remaining soil. By this stage the product is often clean enough for further processing.

Discharge heights from 6 ft. 6 in. to 25 ft. can be supplied to suit the infeed height of the next piece of equipment in the production line. Water consumption is claimed very low and need not exceed the volume of water passed through a $\frac{1}{2}$ inch pipe at 40 lbf/in².

(*Food Processing Industry* 50(591); 1981; 45)

29 Turbo-mill pulverizer

It is designed to handle salt, spices, sugar, corn, wheat flour, rice, fish meals, gelatin, and plant roots. The machine utilizes high speed revolving wings, violent vortexes, and high frequency vibrating air along with simple impact and shearing to reduce materials to granular or powder form. The machine is reportedly compact and features: screenless operation; easy inspection, maintenance, and cleaning, and efficient product handling without additional blowers. Units are available for particle sizes of from 30-mesh to 400-mesh, and for capacities of 25-5,000 lb/hr. Motor horsepower ranges from 10 to 150.

(*Food Technology* 35(3); 1981; 108)

30 Electronic indicator

A small, hand-held instrument from Beckman Instruments, Inc., is designed to enable food distributors, processors, and storekeepers of moisture-sensitive products to test or adjust environmental conditions in storage areas for proper relative humidity levels.

According to Beckman, the HumiChek II features a built-in calibration adjustment for quick measurements that are accurate to within $\pm 2\%$ in the 20-90% relative humidity span. The overall measurement range is 15-90%.

To operate the instrument, the user rotates a calibrated thumb wheel until two indicator lights turn off then reads the relative humidity directly from the wheel. The Beckman instrument also features an electronic sensing element and a double protective shroud.

(*Cereal Foods World* 26(4); 1981; 202)

31 Double arm mixer

Sigma double arm mixer is like a pair of automatic arms. It is for use in the baking, pharmaceutical plants and hotel/catering industry. Two powerful arms traverse in elliptical paths in the rotating bowl. The left arm practically touches the sides and bottom of the bowl while the fork-shaped end of the right arm passes closely over. Thus, every particle of ingredient is brought under direct mixing action. It is reported that water absorption is higher in the double arm mixer than conventional mixer and hence more bread loaves per sack can be obtained. The mixer is made in 100 kg capacity for wheat flour or 240 litres liquid capacity with removable bowl. A smaller version with 25 kg wheat flour capacity or 60 litres liquid capacity with fixed bowl is also available.

(Protein Foods and Nutrition Development Association of India Newsletter No. 26; 1981; 1)

32 Pellet popper and sheeter

Heat and Control, Inc., has introduced a new pellet popper designed to cook corn, rice, potato, and other expanded products uniformly, and a new sheeter that forms uniform crackers, tortillas, chips, and other snack products without constant adjustment.

The pellet popper is available in pilot-lab, high-capacity, and economy models. The economy models can be built to individual specifications with features like a lift-out conveyor with a full-length submersion belt, stainless steel immersion tubes for oil heating, and a lift-off hood. Variable speed drives are standard on all models. Options include automatic oil level controls, control panels, and submersion and take-out belts with stainless steel edges. Other options are also available.

The sheeter features twin cylindrical rollers that the manufacturer claims form a more uniform dough sheet than the conventional concave/convex rollers used on other sheeters. It also features automatic stripping wire replacement on the pneumatic cylinders, a cutting roller that can be removed by hand, and its own variable speed drive system, making the sheeter self-powered.

(Cereal Foods World 26(4); 1981; 201-2)

33 Plate warmer

Providing warm plates in eating areas is not only hygienic but also keeps the food warm and palatable. Economy has introduced plate warmers for warming plates in kitchens, canteens, hotels, restaurants and hospitals. The plate warmer is reported to have elegant appearance. Electric heaters and temperature regulation devices are fitted. Total holding capacity is approximately 150 plates. The equipment is said to have very little electric consumption. With the spring arrangement, warm plates keep coming up one by one.

(Protein Foods and Nutrition Development Association of India Newsletter No. 31; 1981; 1)

34- Microwave preheaters

The machine comprises a resonant cavity for the propagation of the energy emitted by an oscillating magnetron. This resonant cavity is composed of a fixed part, connected mechanically and electrically with the frame of the preheater.

The lower part takes up the wave guide which channels the micro waves, and the drive unit for the rotating table.

(Protein Foods and Nutrition Development Association of India Newsletter No. 31; 1981; 2)

35 Solar milk heater: suitcase type

The device comprises four main parts: a box, an absorber plate, water and milk tanks, and reflectors.

When the solar collector is exposed to sunlight, the reflectors reflect solar beam radiation on to the absorber plate. The collector is set at proper latitude angle by means of the steel rods and nuts. The reflector angles are also adjusted by means of the hinged stands according to the direction of the solar

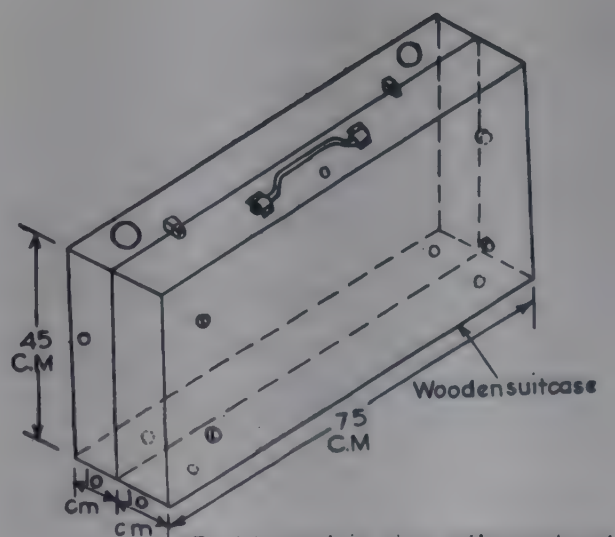


Fig.1 Isometric view: suitcase closed

beams. Water is filled in the water tank. When the water begins to boil, milk is poured into the milk tank. The water takes about two hours to boil and the milk then does not take much time to get heated.

The approximate cost of the present design is Rs. 160/unit. The cost may be reduced by replacing the copper sheet by aluminium sheet and the aluminium sheet by GI sheet; but this would impair the performance to some extent.

(*Invention Intelligence* 16(8); 1981; 369-371)

36 Solar cooker

A compact box type solar cooker has been designed and developed by the Centre for Rural Development and Appropriate Technology at Indian Institute of Technology, Delhi, for cooking food using solar energy during day time on most sunny days. This solar cooker will be very useful for rural areas.

The maximum temperature attained inside the cooker ranges from 115 C - 135 C on most sunny days and foods such as rice pulao, vegetable pulao, meat/mutton pulao, cereals and pulses, vegetables (almost all), milk preparations (such as dalia, kheer, sinmai, custard), cake (both vegetarian and egg cake), sambar, iddli, etc. have been cooked successfully.

Cooking time varies from 55 minute to 2.25 hours depending upon the type and quantity of the food stuff being cooked.

(*Spices Newsletter* 15(10); 1981; 4)

37 Ultraviolet sterilizers

Units for treating both water and other liquids are available to handle flows from 0-3000 gpm and larger. With a unique design the liquid (water) to be treated, passes through the centre of Teflon tubes - not around Quartz tubes as in conventional U/V sterilizers. Cleaning is thus virtually eliminated, and capital cost drastically reduced. Compact unit can be operated by non-technical staff.

(*Food in Canada* 41(2); 1981; 43)

38 Sterilizer-cum-filter

International Industries have introduced INI water purifier, which reportedly guarantees 100% dirt and bacteria from pure drinking water. It incorporates both a sterilizer (for boiling water) and a filter. The INI water purifier is made completely of stainless steel and has seamless, one-piece structure. Applications are in hospitals, restaurants, pharmaceutical/chemical industries, factories and homes to provide fully purified (not merely dirt-free) water for full protection against water-borne diseases. The INI purifier consists of two chambers made wholly of stainless steel. The upper chamber has a water filter which filters out all spores, sediments, dirt and other particles. The lower chamber acts as a boiler-cum-sterilizer which is connected to an electrical point, wherein water is fully boiled for about 20-25 minutes and all remaining bacteria, viruses and germs are destroyed. The special feature of this device is therefore that it combines a water filter with a boiling apparatus.

(Protein Foods and Nutrition Development Association of India Newsletter No. 39; 1981; 1-2)

39 Portable solar collector

A portable solar collector was developed by the Small Farm Energy Project (PO Box 736, Hartington, Ne. 68739, USA). It has been used successfully to dry crops in the fall and provide added space heating in the winter. A technical report on the collector's performance is available for \$2.

(Tranet No. 18; 1981; p 6)

40 Box type solar food dryer

A solar food dryer is an insulated box which uses the sun's heat to dry food. The box is painted a dull black colour inside and out in order to absorb the heat from the sun. Insulation, a porous material placed between a double wall, acts as a barrier against losing the heat.

The black box is then covered with clear plastic or glass. The clear plastic or glass cover lets the sun in the box. Once inside, it is absorbed by the black surfaces of the box, making the air in the

box hotter.

Food dries faster when air is moving inside the box. Two holes are made: one at the bottom to let air in, and one at the top to let air out.

Direction for using the dryer, and as to how to prepare tropical fruits and vegetables for drying, and suggestions for using the dried products are also given.

(*League for International Food Education Newsletter* September 1981; 3)

1 Rice husk fried rice parboiler, dryer and huller

The machine can mill one tonne of rice per hour. Conventional processes, wherein parboiling, drying and hulling are carried out independently, are said to cost almost four times more than the machine developed in Sri Lanka. Further, the yield of milled rice is 15% greater with the new machine due to reduced wastage.

(*RCTT Technical Digest* 2(5); 1981; 2)

2 Mini spray drier

Watson Victor Limited advise of the availability of a miniature spray drier, the product of Buchi of Switzerland, that could solve the perennial problem of the competition for bench space in the laboratory. The Buchi 190 Mini Spray Drier requires only small amounts of sample, takes the place of pilot plant in many applications and offers flexibility to research. It is said to provide a rapid and economic assessment of spray drying procedures and processes during the development phase.

(*Food Technology in Australia* 33(1); 1981; 11)

3 Microwave driers

The Microwave drier is designed to simultaneously expose materials for dehydration, to microwaves and vacuum, which causes rapid removal of moisture, chemicals, dyes, pharmaceuticals, foodstuffs & beverages can be very successfully dried in microwave vacuum dryers which can not be dried by conventional methods. The process is continuous with interlocks and the drying is typically complete in about 30 minutes.

Excellent retention of the qualities like flavour, vitamins during food processing. Temperature of the product is controlled within ± 1 C using infrared thermometer which adjusts the microwave power automatically.

(Protein Foods and Nutrition Development Association of India Newsletter No. 31; 1981; 2)

44 Automatic roasting mill

M/s. G.N. Enterprises, Karjat (Maharashtra) have developed a roasting mill for roasting food grains, where equipment will be operated by electric motor and the food grains will be roasted by mixing them with sand in metal tube by means of electric heaters put around the tube. The same hot sand will be separated from roasted food grains and will be utilised again and again, which will save heat energy. Besides, the productivity will also increase due to automation of the process, for which only one attendant will be required. The output per hour is 100 kg per 1 person against the conventional system of 90 kgs per four persons. Its power consumption cost is Rs. 12/- per hour.

(Technology Awareness Service 7(1); 1981; 13)

45 Super chiller

Cooling water and other fluids to near freezing on a continuous basis may be accomplished using the 33 Super Chiller. Featuring all aluminium construction, the unit consists of vertical corrugated plates which contain a liquid refrigerant (Usually ammonia R-12 or R-22). the water or other liquid to be cooled is distributed so that a thin sheet covers the entire plate. As the fluid falls, it is cooled to near freezing. The system reportedly melts any small quantities of fluid that freezes. The chiller is designed so that it may be easily cleaned, inspected, and added on to.

(Food Technology 35(2); 1981; 99-100)

46 Spiral food freezing system

The Cryo-Shield JE-U6-is a CO₂ cryogenic system that can handle both slow-freezing and fast-freezing foods efficiently. Combining low temperatures with variable cryogen use rate, the system uses a

Praso valve which reportedly reduces waste and results in faster cooling and higher capacities. With a shipping width of under 12 ft, the complete freezer can be fully fabricated and moved into a plant ready to operate. The freezer takes up less than 220 sq ft of floor space. (*Food Technology* 35(2); 1981; 99)

47 Fast tunnel freezers

Engineered to operate on either liquid carbon dioxide or liquid nitrogen, two Kryospray food freezing system offered by Cryochem Inc. enable the food processor to fast-freeze from 200 up to 850 pounds per hour with extremely low power consumption and minimal maintenance.

Foods move rapidly on conveyors through the 20-foot fully insulated tunnels in an ultra-cold environment which is achieved by injecting liquefied gases and circulating them around the products. Temperature sensing probes automatically maintain the desired temperature by adjusting the flow of the inert gases.

Cryo-Chem currently offers two 24-foot tunnel freezers: the Model 2150 with a 2-ft conveyor width and nominal capacity of 200 to 600 lb/hr. and the Model 3150 with a 3-ft conveyor width and 400 to 850 lb/hr. capacity.

(*Food in Canada* 41(3); 1981; 46)

3 New freezer for fishing industry

Fisko Freeze is a new development for Frigo-scandia Contracting. The entirely new in-line freezing concept was developed to solve the need for fast, continuous freezing of whole fish.

Fisko-Freeze utilizes an exclusive hanging clamp system supported by a moving overhead conveyor. Whole fish are hung by the head or nape with special clamps to result in distortion-free frozen shapes. Round fish remain round. Flat sides are eliminated. Section pans packed with crab meat or herring can also be hung from the special conveyor and frozen in the system continuously.

A high velocity air blast at low temperature combined with the uniform product spacing results in fast freezing times. Production tests prove whole 5 pound salmon are frozen on only 2½ hours to 0°F core temperature.

The vertical hanging configuration results in a very compact arrangement. Capacities range from 1500 up to 5000 pounds per hour. Space required for the largest capacity is only 60 x 15 x 8 feet.

A mini Fiski-Freeze is also available with manual loading and unloading. The mini model is completely self-contained with built-in refrigeration compressors, and is designed for freezing on board smaller fishing vessels.

(*Food in Canada* 41(3); 1981; 46)

49 Walnut bleaching and washing machine

Regional Research Laboratory, Jammu, has developed a Walnut bleaching and washing machine. RRL Jammu carried out research and development work on the following lines: Development of better bleaching chemicals; design of a machine which can not only process walnuts faster but also give better quality product. Mechanisation is even otherwise desirable as walnuts are harvested in the months of September - October and as per supply dates usually committed by exporters the walnuts must reach European market before Christmas because substantial sales of walnuts occur at this time. The present machine has been developed as a result of these efforts. (See also *Food Digest* 4(1); 1981; 8) (*RRL Jammu Newsletter* 8(4); 1981; 19)

50 New insulating system

York Fluid Controls has introduced Perma-Jac "SX" a protective covering system for pipes and fittings. It is a durable plastic insulation jacketing, designed for maximum performance in meeting and exceeding USDA specifications. It is an easily cleaned glossy surface that protects against fungus, mold, mildew, corrosion and moisture.

All "SX" joints are solvent welded to keep out moisture, corrosion and contamination. The tensile properties, and impact strength of the system make it resistant to most chemicals and conditions that can destroy other coatings and coverings.

Perma-Jac can provide years of maintenance - free service at continuous surface temperature of up to 180 F and as low as minus 40 F.

Protective coverings made from Perma-Jac are available in rolls, flat sheets, 90° L's, 45° L's and tees, 1-beam, box beam and other configurations.

(*Food in Canada* 41(1); 1981; 55)

1 Heat resistant coating

Everest heat resistant coatings have a temperature range of up to 620 C (1,100 F). Besides they can be used to resist corrosion, vapour, steam, acid fumes, attacks of acids/alkalis, abrasion, stress, wear-and-tear, petrol, hexane, aliphatic hydrocarbons, oils (vegetable and mineral), fats and fatty acids. Because of the special binder used, it does not get burnt, destroyed or peeled off like ordinary organic paints/coatings. The Everest coating finds applications on structures, machinery, parts and components such as boilers, boiler components, chimneys, dryers, ovens, furnaces, high temperature reactors, autoclaves, pressure vessels, heaters, burners, steam engines, gensets, steam pipes, silencers, engine heads and heat exchangers.

(Protein Food and Nutrition Development Association of India Newsletter No. 26; 1981; 1-2)

2 Activated carbon pack absorbs odours

A new, low cost, space-saving, virtually indestructible packet containing activated carbon to absorb odours and traces of gas in packaged foods, and other products has been announced by Multiform Desiccants Inc.

Activated carbon Minipax features a heat-sealed pouch made of Du Pont Tyvek. This material is said to have exceptionally high tear strength and to be practically puncture-proof. It has a high water vapour transmission rate with porosity closely controlled in manufacture to eliminate any variation in the allowable handling time of Minipax packet, according to Multiform.

The Minipax packet is described also as non-dusting, non-linting, and unaffected by water or moisture. It is chemically inert and conforms to FDA and USDA requirements, making it suitable for food packaging applications.

Minipax packets are available from stock in standard sizes from 5/8" x 13/16" to 1½" x 3" and with packet content weights up to 14 grams. Both custom-designed and larger packaging is available.

(Food in Canada 41(2); 1981; 43)

PACKAGING

53 Egg trays

M/s. Hans Packaging Private Ltd. has started manufacturing unbreakable egg trays in different colours. These trays ensure that the eggs remain in suspension and air is allowed to pass freely. The four holders provided in the cup absorb shock and the trays have a longer life than conventional ones.

According to M/s. R.B. Tandon Agencies Pvt. Ltd., (9^r-E Rajpur Road, Delhi-110 054) the distributor of this product, these trays are lighter in weight compared with other conventional plastic and paper egg trays. It is washable and is said to withstand the temperatures in cold storage and water chiller.

(Packaging Digest 8(2); 1981; 11)

54 Aluminium foil

Pgfoils Limited plan to produce aluminium foil for applications in pharmaceutical, tea, tobacco, packaged food and dairy industries. It provides protection against light, odour, moisture or bacteria, and can be embossed, printed and coated. The foil can be laminated on paper, films and other substrates.

(Protein Foods and Nutrition Development Association of India Newsletter 31; 1981; 1)

55 Aseptic pack for dairy and juice products

Dairy and juice products may be kept fresh for weeks without refrigeration using the aseptic Brik Pak system, available from Brik Pak Inc. Now marketed in over 50 countries, Brik Pak uses a laminated, rectangular-shaped carton that is formed, filled and sealed. It may also be used to package custards and puddings, soups, whey beverages, coffee, edible oils and noncarbonated beverages. The system offers producers, retailers, and consumers convenience in handling and storage since the rectangular cartons are easier to handle and store. Also, because they do not require refrigeration until they are opened, the cartons result in energy savings.

(Food Technology 35(3); 1981; 111)

56 Machine wraps cream sandwich biscuits

Auto Wrappers (Norwich) Ltd., U.K., manufacture the biscuit-on-edge version of the Verso Flow horizontal form, fill and seal machine complete with a new automatic biscuit feeder for cream biscuits; automatic reel splicer unit; print registration equipment and the usual refinements included in Verso Flow machine. The machine will wrap cream sandwich biscuits.

(Protein Foods and Nutrition Development Association of India Newsletter No. 39; 1981; 1)

57 Packaging material and quality of milk

Pasteurized whole milk was packaged in 2 dairy factories in the German Federal Republic using 3 different packaging systems, one of them involving plastic film from 2 different manufactures. Procedures and packaging materials are not stated. Sterilized glass bottles served as control. All samples were stored in darkness at 10 ± 1 C, and examined initially and after storage for 3, 4 and 5 days; triangular tests for taste neutrality were carried out by a panel, and total bacterial counts and ascorbic acid contents were measured. It is concluded from tabulated results that the packaging materials caused changes, sometimes significant, in milk flavour: when changes occurred, the panel unanimously preferred the flavour of bottled milk. There were no significant differences in effects of packaging on loss of ascorbic acid in storage. It is recommended that each dairy factory tests its milk packaging material for taste neutrality.

(Indian Dairyman 33(8); 1981; 520)

58 Toxicity of di-2-ethylhexyl phthalate used in plastics

Di-2-ethylhexyl phthalate DEHP, a plasticizer used in plastics and accounting for 60 per cent of the total weight of the finished product, affects the efficiency of food utilization, recent studies have revealed. The studies carried out at the Industrial Toxicology Research Centre (IRTC), Lucknow, have discovered the toxic nature of DEHP. It leaches out from the plastics and affects the biological environment. The studies have shown that in DEHP exposed animals the absolute weight of kidney, brain and testes decreases, whereas, the weight of liver increases.

According to ITRC estimation of serum enzyme activities indicated that the DEHP administration in rats receiving low protein diet did not cause any liver damage. However, the decrease in growth rate, increase in mortality and testicular lesions observed in low protein diet animals indicated that there existed a relationship between DEHP and the protein component of the diet.

(PTI Science Service 1(2); 1981)

ANALYSIS

59 Dairy products analyser

The new Multispec infra-red milk analyser, made by Berwind Instruments Ltd. is claimed to be the fastest routine analyser produced for liquid milk and other dairy products.

In its automatic version the instrument can perform 425 analyses an hour for fat content; alternatively 300/hour for fat and protein, 225/hour for fat, protein, lactose and total solids by summation or 175/hour for fat, protein, lactose and total solids by direct measurement.

The sample size required for analysis is exceptionally small - less than 6 ml - and the accuracies claimed for fat, protein and lactose (against ISO standard techniques Rose-Gottlieb, Kjeldahl and polarimetry, respectively) are each 0.06 per cent standard deviation. Standard deviation repeatability is 0.02.

Another technical feature of the new instrument is its high-pressure two-stage homogeniser. The first stage is at 240 bar (3,500 lb/in²) and the second stage at 70 bar (1,000 lb/in²). The homogeniser reduces all fat globules to a diameter smaller than the wavelengths used for measurement, so preventing errors due to light-scatter and allowing the same calibration to be used for homogenised and unhomogenised products. (Food Processing Industry 49(589); 1980; 43-44)

60 Triglycerides in vegetable oils

Varian has published a paper describing the use of high pressure liquid chromatography (HPLC) to analyze triglycerides in vegetable oils.

Although pure triglycerides are colourless, odourless and tasteless, they are still of interest to the food industry, especially in the area of quality assurance.

(Food in Canada 41(3); 1981; 48)

61 Analysis of chlorine in water

Water used in poultry processing operations, dairies, rendering plants, and other operations using wet "scrubber" units in their air pollution systems, may be analysed for chlorine using Water-Chex indicators available from Aseptic-Thermo Indicator, Park Davis & Co., Consisting of clear plastic container and dry, water-soluble chemicals that dissolve in the water sample, the low cost disposable indicator displays one of several distinct colours to show chlorine content. The indicators are available in the following chlorine ranges: 0-200 ppm, 0-25 ppm, 0-11 ppm and 0-3.5 ppm.

(*Food Technology* 35(3); 1981; 109)

62 A device for sampling milk during collection

A system for obtaining milk samples that are suitable for both bacteriological and chemical testing was studied by R. Bossuyt of Cent. de Recherches Agronomiques de l'Etat a Gant, Station Latitiere, Ghent, Belgium. The apparatus, which is positioned in the supply pipe to the tanker, consists essentially of 2 hollow needles that can be raised and lowered. An inverted disposable 60 ml sample bottle with a synthetic bung is held firmly above the pipe by means of a fixing mechanism. When the milk is pumped from the farm tank, the needles are initially in the lowered position within the pipe so that any milk left from the previous sampling is rinsed off; the needles are then raised and pierce through the bung so that a portion of the milk will then pass up one needle and down the other leaving some in the sample bottle. The apparatus, is left in this position until collection is complete. The bung is of such material that no permanent hole is left when the needles are withdrawn. Tests on samples from 4 routes each involving 21-24 farms showed very good agreement with corresponding manually obtained samples for bacterial counts ($r=0.937$), fat content ($r=0.993$) and protein content ($r=0.996$).

(*Indian Dairyman* 33(6); 1981; 404)

3 Micro centrifuge

Alfalab have developed a micro centrifuge that accommodated 60 tubes of up to 5 ml capacity at a time. This helps hospitals and labs to speed up their processing of various samples at a faster rate. The device incorporates a solid-state stepless speed controller, automatic timer, and

an on-off mains press switch. It finds applications in determination of corpuscle percentage in blood. Maximum speed is 7,000 RPM, maximum RCF is 3,885 x G and maximum capacity is 300 ml.

(Protein Foods and Nutrition Development Association of India Newsletter No. 31; 1981; 1)

64 Automatic reading of dissolved solids concentrations

Soft drinks, juices, syrups, and other food products, may be monitored using the Model 47 Process Refractometer. The Model 47 may be installed directly in a process line to avoid errors associated with sampling and laboratory analysis techniques. Because the refractometer provides an automatic readout in refractive index or Brix continuously, delays in waiting laboratory results are reportedly eliminated. The refractometer is available with a 19-in, rack-mounted control/readout module.

(Food Technology 33(3); 1981; 102)

65 Edible oil colorimeter

Edible Oil Colorimeter, which is designed to replace the visual systems of analysis, is described in a 6-p brochure. The colorimeter measures the optical density of the sample at 2 points in the spectrum and these values are used to indicate the red and yellow content of the sample. To correct for the affects of suspended solid particles and bubbles, a third measurement is made at a point in the spectrum where all edible oils transmit freely. The yellow meter scale is calibrated from 0-40 units, while the red meter carries a dual scale. One scale reads from 0-4 units red, while the other extends this range from 0-20 red units. The colorimeter accepts standard cells with optical path lengths of up to 5¼ in. The light source is a 20 W tungsten halogen lamp.

(Food Technology 35(2); 1981; 102)

66 Rancidity analyzer

Brinkmann Instruments, Inc., has announced the availability of the new Metrohm Rancimat E 617 for determining the oxidation stability (proneness to rancidity) of edible oils and fats. Up to six samples can be analyzed simultaneously on the Metrohm Rancimat with results automatically recorded on a multi-colour graph.

Samples are subjected to a stream of atmospheric oxygen at high temperatures. The onset of oxidation degeneration produces organic acids, which are carried over to a measuring vessel and mixed with water. Induction time (rancidity) is determined by the conductivity of this solution.

The Metrohm Rancimat system comes with oil bath, 800-watt heater, air pump, conductivity amplifier, six-colour recorder, and all necessary vessels and electrodes for up to six independent samples.

(Cereal Foods World 26(3); 1981; 148)

COMMERCIAL INTELLIGENCE

PRODUCTION (RAW MATERIAL)

67 Coconuts - All India trend in area, production & yield

Year	Area (000 hectares)	Production (Million nuts)	Yield (Nuts per hectare)
1975-76	1070	5829	5448
1976-77	1075	5765	5363
1977-78	1057	5413	5121
1978-79	1067	5471	5127

(Profodcil Bulletin 15(3); 1980; 16)

68 All India final estimate of food grain production (1980 - 81)

(Production - in thousand tonnes)

State	Rice	Jowar	Bajra	Maize	Ragi	Small millets	Wheat	Barley
Andhra Pradesh	7134.2	1089.0	339.8	570.9	245.9	211.5	9.3	-
Assam	2522.8	-	-	13.4	-	4.1	118.3	-
Bihar	5476.0	4.9	6.5	1036.0	114.2	52.4	2825.0	100.0
Gujarat	556.6	583.0	1221.9	403.1	35.6	106.7	1298.3	3.4
Haryana	1228.0	48.0	484.0	83.0	-	-	3600.0	150.0
Himachal Pradesh	96.9	-	-	428.6	7.8	12.8	283.1	36.4
Jammu & Kashmir	546.4	0.1	9.3	493.3	-	12.0	206.4	8.6
Karnataka	2210.0	1396.8	200.0	397.7	1160.0	180.0	177.8	-
Kerala	1291.8	0.9	-	-	0.8	1.2	-	-
Madhya Pradesh	4001.9	1647.4	106.5	677.2	6.0	312.7	3056.2	255.5
Maharashtra	2360.6	4427.5	759.9	125.4	209.6	78.7	931.3	7.0
Manipur	273.0	-	-	17.8	-	-	-	-
Meghalaya	132.6	-	-	14.0	-	2.7	4.1	-
Nagaland	91.4	-	-	11.8	-	-	-	-
Orissa	4331.0	26.3	4.6	126.4	177.1	86.7	121.5	-
Punjab	3223.0	0.8	89.0	602.0	-	-	7700.0	106.0
Rajasthan	149.8	340.0	1163.5	784.9	-	3.5	2390.0	517.4
Tamil Nadu	3975.0	535.3	295.0	22.6	317.0	251.4	0.4	0.2
Tripura	390.0	-	-	-	-	-	10.3	-
Uttar Pradesh	5440.0	400.3	717.9	909.6	164.7	240.0	13133.8	1023.5
West Bengal	7465.6	0.1	0.6	55.6	9.8	7.1	473.2	31.2
Andaman & Nicobar Islands	18.5	-	-	-	-	-	-	-
Arunachal Pradesh	88.8	-	-	25.6	-	13.9	3.0	-
Dadra & Nagar Haveli	13.6	0.6	-	-	3.6	0.5	0.3	-
Delhi	7.8	3.2	11.3	0.5	-	-	117.7	2.6
Goa, Daman & Diu	116.6	-	0.4	-	8.2	-	-	-
Mizoram (E)	28.3	-	-	4.9	-	-	-	-
Pondicherry	60.5	-	7.6	-	4.4	0.1	-	-
All India Total	53231.0	10504.2	5417.8	6804.3	2464.7	1578.0	36460.0	2241.8

(Directorate of Economics and Statistics, Ministry of Agriculture, Government of India)

69 All India final estimate of pulses (1980 - 81)

(Production in thousand tonnes)

State	Gram	Tur	Black gram	Green gram	Horse gram	Lathy-rus	Lentil	Cow pea	Soya bean	Other pulses
Andhra Pradesh	13.2	44.2	108.2	177.8	68.1	-	-	-	-	7.1
Assam	1.8	4.8	17.6	5.6	-	3.8	6.2	-	-	-
Bihar	140.0	100.0	56.2	5.8	36.1	-	-	-	-	8.7
Gujarat	47.0	141.6	-	-	-	-	-	-	-	77.9*
Haryana	650.0	9.0	-	-	-	-	-	-	-	45.0*
Himachal Pradesh	10.4	0.4	-	-	-	-	-	-	-	13.3*
Jammu & Kashmir	1.7	-	10.3	4.9	1.1	-	0.5	-	-	1.4
Karnataka	86.0	200.0	20.4	32.7	247.0	-	-	-	-	41.2
Kerala	-	0.8	1.3	0.8	8.1	-	-	-	-	0.5
Madhya Pradesh	1125.6	288.2	168.9	52.2	50.9	189.3	115.6	1.8	121.8	-
Maharashtra	150.2	359.8	105.6	94.9	56.6	14.5	2.4	-	-	12.6
Manipur	0.1	-	-	-	-	-	-	-	-	2.3*
Meghalaya	0.1	0.5	-	-	-	-	-	-	-	0.9*
Nagaland	-	-	-	-	-	-	-	-	-	2.3*
Orissa	26.7	43.5	223.8	362.7	227.8	-	-	7.3	-	80.6
Punjab	200.0	13.0	8.2	10.7	-	-	-	-	-	13.3*
Rajasthan	854.6	12.3	63.7	46.0	-	-	9.9	-	-	13.0
Tamil Nadu	3.6	39.8	55.2	34.9	41.3	-	-	-	-	9.2
Tripura	0.2	0.2	0.3	0.2	-	-	0.3	-	-	0.8
Uttar Pradesh	1284.0	738.5	57.9	53.4	-	-	148.9	-	-	-
West Bengal	55.6	17.1	64.9	15.3	1.4	49.5	30.3	-	0.4	2.5
Andaman & Nicobar Islands	-	-	-	-	-	-	-	-	-	0.4*
Dadra & Nagar Haveli	-	1.1	1.2	-	-	-	-	-	-	0.2*
Delhi	1.1	-	-	-	-	-	-	-	-	0.8*
Mizoram (E)	-	-	-	-	-	-	-	-	-	-
Pondicherry	-	-	2.5	0.8	-	-	-	-	0.2	-
All India Total	4651.9	2014.8	966.2	898.7	738.4	257.1	314.1	9.1	122.4	334.0

* Total of all pulses which may include those listed in the table also; individual figures for each pulse not available.

(Directorate of Economics and Statistics, Ministry of Agriculture, Government of India)

70 Coconuts : State wise production (Million nuts)

State	1978-79
Andhra Pradesh	169
Assam	34
Karnataka	813
Kerala	3075
Maharashtra	43
Orissa	73
Tamil Nadu	1057
Tripura	1
West Bengal	22
Andaman	61
Goa, Daman Diu	85
Lakshadweep	22
Pondicherry	16
Total	5471

(Profodcil Bulletin 15(3); 1980; 17)

71 District-wise estimates of area and production of banana, 1978-79 (Final)

State/District	Area (Hectares)	Production (Tonnes)
1	2	3

Andhra Pradesh

Srikakulam	300	2,900
Visakhapatnam	1,200	14,500
East Godavari	7,600	1,10,000
West Godavari	3,300	47,000
Krishna	100	1,200
Guntur	1,900	22,500
Nellore	300	3,300
Kurnool	1,300	15,100
Cuddapah	1,400	41,700
Chittoor	400	3,900
Rangareddi	100	1,200
Medak	100	400
Warangal	100	1,200
Other districts	-	-
Total	18,100	2,64,900

	1	2	3
<i>Assam</i>			
Cachar		1,280	16,100
Goalpara		2,590	34,130
Kamrup		5,070	63,060
Darrang		2,770	35,502
Nowgong		1,290	17,890
Sibsagar		3,590	49,658
Lakhimpur		1,270	16,541
Dibrugarh		2,100	27,075
Mikir Hills		1,440	16,860
N.C. Hills		270	3,240
Total		21,670	2,80,056

Bihar

Patna	4	20
Gaya	20	100
Nawadah	3	15
Bhojpur	1	5
Rohtas	1	5
Saran	114	570
Siwan	87	435
Gopalganj	63	315
Champan East	504	5,821
Champan West	282	2,445
Muzaffarpur	923	3,184
Vaishali	2,103	12,218
Sitamarhi	473	2,128
Darbhanga	217	1,085
Madhubani	351	1,408
Samastipur	698	4,342
Begusarai	172	860
Monghyr	70	350
Bhagalpur	319	1,595
Santhal Parganas	3	15
Saharsa	419	1,508
Purnea	1,102	1,245
Katihar	290	1,450
Hazaribagh	6	30
Ranchi	30	150
Palamau	5	25
Other districts	-	-
Total	8,260	41,324

contd.

1	2	3
<i>Gujarat</i>		
Ahmedabad	250	1,079
Baroda	2,766	72,231
Broach	1,236	22,106
Bulsar	559	12,434
Kaira	233	4,749
Panchmahals	15	302
Surat	10,328	2,38,410
Bhavnagar	61	1,209
Jamnagar	7	216
Junagarh	1,315	28,539
Kutch	35	907

Total	16,805	3,82,182

Karnataka

Bangalore	470	2,464
Belgaum	1,020	17,524
Bellary	306	1,622
Bidar	89	468
Bijapur	650	3,358
Chikmagalur	1,217	16,720
Chitradurga	312	1,782
Dakshina Kannada	3,026	5,324
Dharward	297	1,577
Gulbarga	601	3,187
Hassan	787	1,870
Kodagu	1,207	3,490
Mandya	667	3,505
Mysore	686	3,813
Raicher	181	960
Shimoga	1,580	3,844
Tumkur	681	1,832
Kolar	290	1,526
Uttara Kannada	1,824	4,447

Total	15,891	79,313

Kerala

Trivandrum	4,667	56,620
Quilon	5,240	55,867
Alleppey	3,729	40,068
Kottayam	5,890	87,239
Ernakulam	5,086	68,292
Trichur	5,388	62,474

contd.

1	2	3
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Kerala - contd.

Palghat	2,958	38,288
Malappuram	4,543	50,739
Kozhikode	3,655	42,887
Cannanore	6,126	75,288
Idukki	2,802	37,637

Total	50,084	6,15,399
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Madhya Pradesh

Sagar	13	376
Damoh	1	-
Jabalpur	2	30
Mandla	3	106
Hoshangabad	10	145
East Nimar (Khandwa)	6,376	1,27,339
Balaghat	63	1,002
Betul	2	-
Chindwara	7	235
Seoni	1	34
Durg	18	263
Rajnandgaon	15	325
Raipur	15	230
Bilaspur	73	1,032
Surguja	58	783
Raigarh	89	1,567
Bastar	92	1,693
Shivpuri	2	-
Guna	3	34
Ratlam	1	-
West Nimar (Khargoon)	481	8,548
Dhar	476	9,830
Rewa	10	95
Satna	8	169
Sidhi	16	45
Shahdol	26	416
Tikamgarh	8	157
Chhatarpur	2	57
Panna	3	30
Other districts	-	-
Non-reporting areas	2	-

Total	7,876	1,54,541
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contd.

	1	2	3
<i>Maharashtra</i>			
Thane	1,300		15,700
Kulaba	100		1,700
Ratnagiri	400		5,200
Dhule	700		16,300
Jalgoan	34,500		9,48,900
Ahmednagar	200		4,700
Pune	500		14,100
Satara	100		4,700
Sangli	200		9,400
Sholapur	400		14,100
Aurangabad	600		9,500
Parbhani	1,800		40,600
Bhir	100		4,600
Nanded	1,500		55,400
Osmanabad	300		4,600
Buldhana	1,100		14,200
Akola	100		-
Amravati	300		4,400
Yavatmal	200		-
Wardha	900		35,500
Nagpur	100		-
Other districts	-		-
Total	45,400		12,03,600
<i>Manipur</i>			
	1,680		21,920
<i>Meghalaya</i>			
	2,885		38,026
<i>Orissa</i>			
Balasore	3,972		35,748
Bolangir	426		6,130
Cuttack	4,500		28,250
Dhenkanal	725		4,800
Ganjam	1,012		6,084
Kalahandi	250		3,000
Keonjhar	264		1,460
Koraput	1,220		7,540
Mayurbhanj	450		2,831
Phulbani	400		1,600
Puri	2,770		16,620
Sambalpur	470		3,760
Sundargarh	1,120		6,160
Total	17,579		1,23,983

contd.

1	2	3
<i>Tamil Nadu</i>		
Chengalpattu	1,300	22,570
South Arcot	1,000	19,760
North Arcot	3,000	71,280
Salem	3,000	59,280
Dharmapuri	3,000	66,480
Coimbatore	4,750	97,660
Tiruchirapalli	13,000	3,59,840
Padukkottai	150	4,140
Thanjavur	5,000	92,000
Madurai	13,000	3,28,640
Ramanathapuram	2,270	36,040
Tirunelveli	7,500	1,30,200
The Nilgiris	350	1,320
Kanya Kumari	1,600	23,680
Total	58,920	13,12,890
<i>Tripura</i>		
	2,843	18,034
<i>Uttar Pradesh</i>		
Bijnor	4	16
Mainpuri	1	4
Jaunpur	6	24
Gorakhpur	436	1,724
Deoria	43	170
Basti	26	103
Kheri	4	16
Nainital	6	24
Almora	2	8
Pithoragarh	47	186
Dehradun	3	12
Uttar Kashi	2	8
Garhwal	10	39
Chamoli	4	16
Other districts	-	-
Total	594	2,350
<i>Andaman & Nicobar Islands</i>		
	867	3,648
<i>Mizoram</i>		
	675	3,860

contd.

NOTE: Banana is not grown to any appreciable extent in other States/Territories/districts not mentioned above.

(Agricultural Situation in India 35(9); 1980; 710-12)

72 Improvement of Market for Indian essential oils

In view of the increase in price of the synthetic substitutes, the market for Indian essential oils has shown an upward trend. The trade circles hope that this upward trend in exports in the last two years can be maintained or improved further.

During the period 1974/75 (1.4.74 - 31.3.75) the export of oils touched a record Rs. 97 million. In the following years, the export slumped, but went up again during 1977/78 to Rs. 61 million. During 1978/79 (later figures are not available) the export may have reached around 62.0 million.

The production potential is, indeed, very favourable owing to the occurrence of around 1300 oil-containing plants (according to an Unctad study). However, the utilization (harvest) of these plants is not organised fully and is mostly confined to simple gathering (collection). The possibilities of regular cultivation in plantations or as short term crop (intermediate crop) are, apart from a few exceptions (lemon grass), not utilized. So the export is confined to a few products mainly sandal wood, lemon grass, and palmarosa oil. The opening of foreign markets from what we learn has proved to be very difficult for the beginners. This is true especially as regards Europe and the USA, the two most important Indian markets. There the resident importers - so it is reported - nurture business connections only with known and approved contractors (suppliers), owing to malpractices in production. Moreover, the competition in the last few months has become more intensive, because a few countries have utilized the rise in prices, and have started exporting.

The People's Republic of China, Indonesia, Argentina, and Brazil can be considered as the most important competitors of India. As regards sandalwood oil, traditionally the most important export product of India, Singapore and Australia have entered the market; although their oil is not genuine, according to Indian reports, it is, nevertheless, an oil of good quality related to it.

(Riechstoffe. Aromen. Kosmetika 31(2); 1981; 58)

73 Cardamom production

The final estimate of production of cardamom for the crop season 1980-81 is placed at 4400 M.T. with state-wise break-up as follows:

State	Production (M.T.)
Kerala	3,100
Tamil Nadu	300
Karnataka	1,000
Total	4,400

(Cardamom 13(9); 1981; 15)

74 All India final estimate of coriander 1980-81

STATE	Area (Thousand Hectares) 1980-81 (Final)	Production in terms of coriander seeds (Thousand tonnes) 1980-81 (Final)
Andhra Pradesh	72.3	21.8
Bihar	5.7	4.0
Haryana	0.4*	0.2*
Karnataka	18.5	2.1
Madhya Pradesh	29.2	8.4
Orissa	12.2	4.8
Rajasthan	61.5	35.0
Tamil Nadu	40.0	15.5
Uttar Pradesh	8.0*	4.8*
All India	247.8	96.6

* 1979-80 data repeated in the absence of data for 1980-81.

- NOTE : 1. No information regarding crop estimates is yet available from the Government of Sikkim.
2. Coriander is not grown to any appreciable extent in States and Union Territories not mentioned above.

(Directorate of Economics and Statistics, Ministry of Agriculture)

75 Indian livestock census, 1977

(Thousands)													
State	Cattle			Buffaloes			Sheep	Goats	Pigs	Ca- mels	Oth- er live stock	Total live stock	Poul- try
	Total	Total	Total	Total	Total	Total							
	Males over 3 years	Females over 3 years	cattle	Males over 3 years	Females over 3 years	buff- aloes							
Andhra Pradesh	5,401	4,114	12,041	1,275	3,668	7,163	7,064	4,364	755	(à)	58	31,472	21,609
Assam	2,261	1,803	5,796	201	163	489	51	1,258	397	(a)	1	8,002	8,879
Bihar	7,135	4,571	15,074	779	2,089	4,363	1,121	9,661	946	(a)	28	31,285	14,311
Gujarat	2,876	1,697	6,006	35	2,093	3,473	1,592	3,084	34	56	85	14,406	3,426
Haryana	956	732	2,442	94	1,531	2,940	541	520	203	131	102	6,905	1,389
Himachal Pradesh	825	685	2,106	12	385	560	1,055	1,035	5	1	18	4,795	330
Jammu & Kashmir	768	786	2,138	45	304	500	1,216	692	5	3	36	4,659	2,440
Karnataka	3,877	3,826	10,222	297	1,919	3,278	4,536	3,388	296	1	52	21,800	9,696
Kerala	371	1,371	3,006	219	157	454	3	1,683	173	-	(a)	5,319	13,389
Madhya Pradesh	9,680	8,241	26,253	1,149	2,612	5,845	968	6,725	361	12	47	40,329	7,157
Maharashtra	6,320	4,762	15,168	320	2,153	3,887	2,614	7,568	226	1	49	29,591	18,175
Manipur	125	95	294	16	21	52	2	16	134	-	8	507	938
Meghalaya	157	177	477	11	17	40	20	119	152	-	(a)	814	1,073
Nagaland	27	37	93	2	4	8	(a)	24	238	-	10	375	715
Orissa	4,869	4,185	12,121	594	435	1,358	1,432	3,417	295	-	(a)	18,627	9,190
Punjab	1,412	923	3,390	268	1,948	3,795	388	801	46	102	74	8,646	3,017
Rajasthan	4,008	4,862	12,896	190	2,785	5,072	9,938	12,807	120	752	215	41,359	1,590
Sikkim	49	57	158	(a)	3	5	16	89	19	-	4	292	221
Tamil Nadu	4,644	3,797	10,801	384	1,636	3,077	5,289	4,202	678	(a)	88	24,146	14,347
Tripura	238	184	592	6	5	14	3	199	43	(a)	-	653	665
Uttar Pradesh	13,634	6,650	25,771	1,840	7,288	13,966	2,059	8,463	1,606	39	237	52,344	5,478
West Bengal	4,739	3,806	11,878	522	205	824	793	5,211	352	(a)	2	19,085	15,492
Andaman & Nicobar Islands	9	9	27	3	4	10	(a)	18	21	Nil	Nil	76	184
Arunachal Pradesh	58	62	168	2	5	11	20	74	214	-	91	583	870
Chandigarh	2	1	4	(a)	8	12	1	2	(a)	(a)	(a)	19	51
Dadra & Nagar Haveli	16	12	38	1	1	3	(a)	12	1	-	-	54	45
Delhi	15	17	48	3	67	109	9	20	11	(a)	4	206	217
Goa, Daman & Diu	56	36	122	11	19	40	1	20	78	-	(a)	261	413
Lakshyadweep	(a)	1	1	-	(a)	(a)	(a)	5	-	-	-	6	26
Mizoram	14	16	49	1	1	3	1	23	45	-	(a)@	123	1,128
Pondicherry	22	37	92	1	6	10	5	39	2	-	(a)	148	148
All India	74,459	56,398	1,78,341	8,066	29,243	56,426	39,993	67,518	6,896	1,109	1,113	3,53,338	1,38,544

(a) - Below 500

In Arunachal Pradesh, data given above under 1972 census were actually collected on 2 per cent enumeration basis and sample was not adequate to give reliable figures. 1978 census figures which were collected in the Union Territory on 100 per cent enumeration basis are not strictly comparable with 1972 figures.

For Assam, Manipur, Punjab, Sikkim and W. Bengal, the figures are for 1972.

(Agricultural Situation in India 35(9); 1980; 704-707)

PRODUCTION (INDUSTRIAL)

76 Production of molasses

The Union Minister for Petroleum, Chemicals and Fertilizers has informed the Lok Sabha that the total production of molasses in the country, in the molasses year 1980-81 (Nov. - Oct.), is estimated to be 20.79 lakh tonnes.

Molasses is subject to statutory price control. The maximum prices at which molasses can be sold is fixed under the Molasses Control Order, 1961, as amended from time to time.

The maximum prices prevailing at present are as under :

<u>Grade of Molasses</u>	<u>Price</u>
<u>Grade K-I</u>	Rs. 9/- per 100 kg.
Total reducing sugar by weight about 60%	
<u>Grade K-II</u>	Rs. 7.50 per 100 kg
Total reducing sugar by weight from 55 to 60%	
<u>Grade K-III</u>	Rs. 6/- per 100 kg
As per specification Grade I cane molasses	
<u>Grade K-IV</u>	Rs. 4.80 per 100 kg
As per specification of Gr.III cane molasses	
<u>Grade K-V</u>	Rs. 3.60 per 100 kg
As per specification of Gr.III Cane molasses	
<u>Below grade K-V</u>	Rs. 3.60 for every 40 kg reducing sugar content therein.
<u>Grade I</u>	Rs. 6/- per 100 kg
<u>Grade II</u>	Rs. 4.80 per 100 kg
<u>Grade III</u>	Rs. 3.60 per 100 kg
<u>Below Grade III</u>	Rs. 3.60 for every 40 kg reducing sugar content therein.

The above prices are exclusive of any excise duty or cess that may be levied under any law but include cost of loading the molasses in tank wagons, etc.

(N.S.I. News No. 16/17; 1981; 11-12)

77 Production of Alcohol

The Central Molasses Board has estimates that in the current alcohol year 1980-81 (December-November), the availability of alcohol is likely to be 4,200 lakh litres as against an estimated aggregate demand of 5,716.79 lakh litres.

All the State Governments have been requested to augment the availability of alcohol by promoting the use of Khandsari Molasses for alcohol production.

(N.S.I. News No. 16/17; 1981; 13)

78 Pesticides Industry

Pesticides industry has been having a good time in recent years with 74,700 tonnes in 1980.

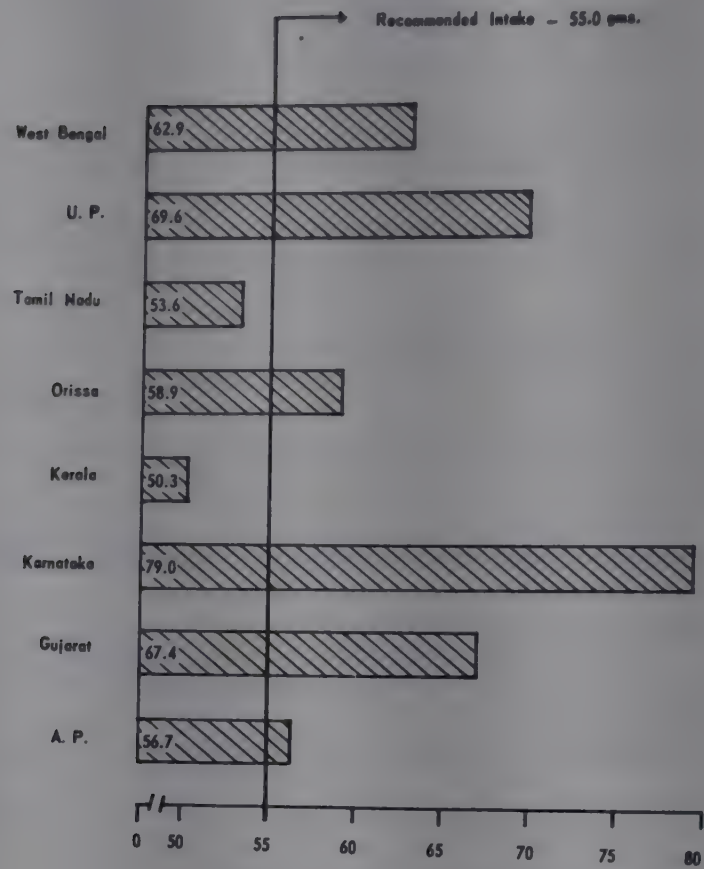
At present, there are 23 units manufacturing technical grade material. There are another 50 units in the medium scale sector making formulations coupled with another 200 units in the small scale sector engaged in the manufacture of conventional formulations.

Production, after rising from 35,200 tonnes in 1975 to 53,200 tonnes in 1979, fell to 43,500 tonnes in 1980.

In the sixth plan, it is proposed to expand the area under plant protection from 8 crore hectares to 10 crore hectares. Further it is proposed to: (i) minimise the losses arising out of pests and diseases, (ii) strengthen surveillance against pests and diseases with special attention being placed on tribal areas, and (iii) increase the consumption of pesticides from 60,000 tonnes to 80,000 tonnes of technical grade material.

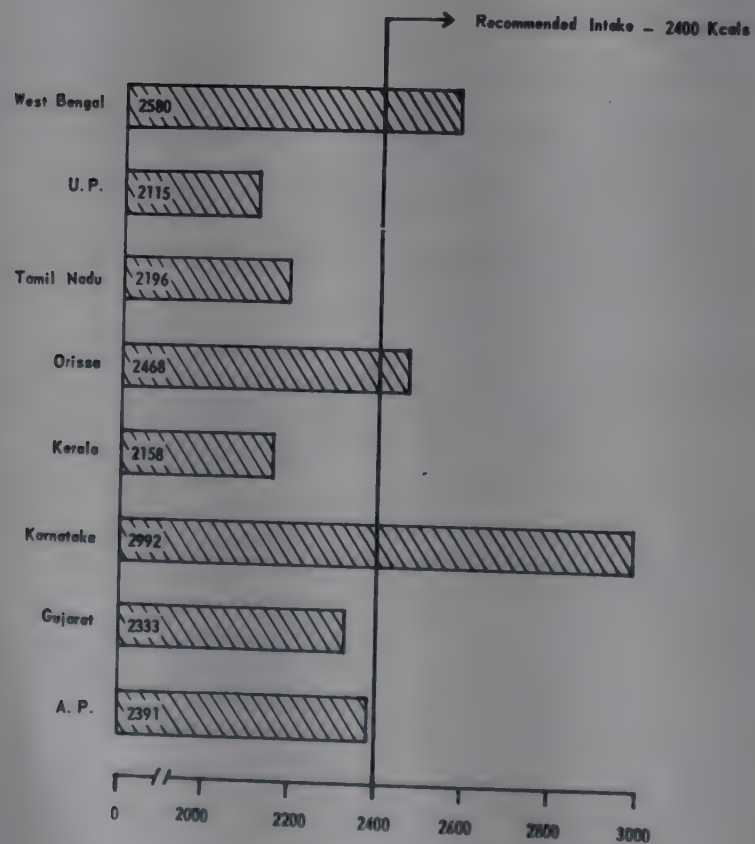
(Industrial News Digest 4(11); 1981; 11-12)

79 AVERAGE INTAKE OF PROTEINS IN RURAL INDIA



(Source : NNMB Report 1981, NIN)

80 AVERAGE INTAKE OF CALORIES IN RURAL INDIA



(Source : NNMB Report 1981, NIN)

EXPORT

81 Exports of gum karaya

COUNTRY	1977-78		1978-79	
	Quantity	Value	Quantity	Value
France	1267199	16414311	1028408	15972439
German D. Republic	25000	300000	75000	1035000
German F. Republic	248877	3934554	172013	2457305
Greece	124960	407130	-	-
United Kingdom	1106425	14180825	1345185	20042519
United States of America	3639139	41305971	3778985	50581822
Others	426352	3907368	240647	4483705
Total	6837952	80450159	6649238	94572790

(Profodcil Bulletin 15(3); 1980; 23)

82 Exports of spices from India during the financial years 1980-81 and 1979-80

(Quantity: M. Tons
Value in '000 Rs.)

Commodities	1980-81		1979-80	
	Quantity	Value	Quantity	Value
Pepper whole	25,240.46	3,65,248.32	20,836.39	3,32,656.89
Pepper white	3.31	115.72	-	-
Dehy. Green Pepper	49.78	1,965.06	47.02	2,148.25
Pepper powder	43.25	1,109.00	15.04	419.66
Total Pepper	25,336.80	3,68,438.10	20,898.45	3,35,224.80
Cardamom small	2,437.47	3,61,538.14	2,637.07	4,80,611.27
Cardamom big	159.83	3,346.09	366.58	8,241.58
Chillies whole	7,333.52	47,283.60	9,581.07	71,361.47
Chillies powder	295.93	2,795.64	681.73	5,940.15
Total chillies	7,629.45	50,079.24	10,262.80	77,301.62
Ginger	5,482.57	28,672.51	11,381.11	71,829.14
Ginger powder	67.67	559.07	104.87	866.95
Total ginger	5,550.24	29,231.58	11,485.98	72,696.09

contd.

contd.

	1980-81		1979-80	
	Quantity	Value	Quantity	Value
Turmeric	9,613.19	50,074.28	14,150.13	1,06,335.62
Turmeric powder	1,825.17	10,318.86	12,459.71	91,725.39
Total turmeric	11,438.36	60,393.14	26,609.84	1,98,061.01
Curry powder	2,238.98	21,730.83	2,644.27	25,563.43
Coriander seed	1,340.55	7,529.83	3,721.77	11,667.04
Coriander powder	307.98	2,214.13	603.34	3,031.34
Total coriander	1,648.53	9,743.96	4,325.11	14,698.38
Cumin seed	6,693.37	73,909.90	17,830.54	2,12,068.80
Cumin powder	67.75	801.44	-	-
Total cumin	6,761.12	74,711.34	17,830.54	2,12,068.80
Celery seed	1,664.00	8,311.57	3,153.48	19,265.16
Celery powder	3.12	16.96	-	-
Total celery	1,667.12	8,328.53	3,153.48	19,265.19
Fennel seed	1,036.84	7,503.53	1,911.46	12,487.09
Fennel powder	1.26	9.41	0.11	0.91
Total fennel	1,038.10	7,512.94	1,911.57	12,488.00
Fenugreek seed	3,085.03	11,885.26	4,798.31	15,661.81
Fenugreek powder	0.10	0.73	-	-
Total fenugreek	3,085.13	11,885.99	4,798.31	15,661.81
Garlic whole	5,947.93	14,955.89	2,825.55	8,319.15
Dehy. garlic	239.57	2,760.57	349.22	4,416.22
Garlic powder	101.66	1,073.45	205.30	2,663.21
Total garlic	6,289.16	18,789.91	3,380.07	15,398.58
Mace	-	-	10.60	13.47
Nutmeg	3 kg	0.52	1.42	16.53
Nutmeg powder	2.00	29.00	-	-
Total nutmeg	2.00	29.52	1.42	16.53
Cassia	681.65	5,484.10	957.20	4,873.03
Cassia powder	14.00	231.34	-	-
Total cassia	695.65	5,715.44	957.20	4,873.03
Ani seed	1.60	17.50	172.30	1,328.57
Tejpat	224.96	474.10	1,269.15	1,284.17
Misc. spices	697.50	5,851.72	2,042.59	23,284.81
Oils of spices	12.93	4,822.85	19.66	8,258.74
Oleoresins of spices	148.87	21,761.68	181.61	24,424.84
Total	77,063.80	10,64,402.60	1,14,958.60	15,50,764.69

Source: 1979-80: DGCIS, Calcutta.

Oils and oleoresins and 1980-81: Customs lists -
provisional figures.

Cardamom Small : Cardamom Board.

(Spices Newsletter 15(8); 1981; 6)

83 Export of spices by air from Trivandrum Airport

Exports of spices like cardamom, ginger, pepper and turmeric are permitted through Trivandrum Airport.

Goods brought for export through Trivandrum Airport will be stored in the custody of the exporters or in the storage place allotted by the carriers. No responsibility for the storage, upkeep and maintenance of the cargo would be taken by the customs department. The goods will be examined at the Airport in the area earmarked for the same by the Airport authorities. Goods for export shall be produced for preshipment, customs inspection/examination by exporters agents/or the carriers at their own risk and expenses well ahead of the time of departure of flight to enable proper customs inspection/examination/documentation. Goods which are rejected or not exported for any reason, shall be removed from Airport and stored at the expense/risk of the exporters agents or carriers.

Our member-exporters may make use of the facility available at Trivandrum Airport.

(*Spices Newsletter* 15(7); 1981; 9)

TRADE INFORMATION

84 International Cocoa pact to help stabilization

A new International Cocoa Agreement has been negotiated and becomes effective on April 1, if a sufficient number of countries sign the treaty. It is designed to stabilize the world price of cocoa and the primary means of stabilization is through establishment of a buffer stock that would buy and sell cocoa beans as dictated by world market price levels.

The Agreement provides for a minimum price of \$1 per pound and a maximum of \$1.60 with lower and upper intervention prices of \$1.10 and \$1.50 per pound respectively. If market prices drop to or below the lower intervention price, the Buffer Stock Manager must purchase cocoa until market prices go above \$1.10. Conversely, if prices are at or above the \$1.50 level, he must sell the cocoa at his disposal until prices fall below this level.

(*Food in Canada* 41(3); 1981; 13)

5 Importers, dealers of spices in US

American Roland Corp.
16, Hudson Street,
New York, NY 10013

Betger & Plate Company,
One California Street,
San Francisco, CA 941041.

Carter, Macy Co., Inc.
120 Wall Street,
New York, NY 10005.

California & Commodities Corp.,
320 California Street,
San Francisco, CA 94104

Central Indonesian Trading
Company, Inc.,
30 Vessey Street, Room 902,
New York, NY 10007.

Daarnhouwer & Co., Inc.
155 John Street,
New York, NY 10038

Furth Louis, Inc.
Stewart Avenue
Brooklyn, NY 11237

Golombeck, Morris, J., Inc.
960 Franklin Avenue,
Brooklyn, NY 11237

Gonzalez, Thos.P., Corp.,
1960 South Santa Fe Avenue
Los Angeles, CA 90021.

Hismoel (American Co.) Inc.
9000 Sunset Boulevard
Suite 1402
Los Angeles, CA 90069.
Internatio, Inc.
116 John Street,
New York, NY 10038.

K.H.L. Flavors, Inc.,
70-49 Austin Street,
Post Office Box 308,
Forest Hills, NY 11375.

Malagasy Agencies, Inc.
One World Trade Center
Suite 1951
New York, NY 10048.

Martin, Wm. E. & Sons Co., Inc.
Colonial Office Box 408,
Post Office Box 408,
Port Washington, NY 10050.

Mincing Trading Corp.
25 Broadway,
New York, NY 10004.

Norda Inc.
475 Tenth Avenue
New York, NY 10018.

Overseas Produce Corp.
129 Halstead Avenue,
Post Office Box 296
Mummaroneck, NY 10543.

Reliable Mercantile Co., Inc.
401 Broadway,
New York, NY 10013.

Sokol & Company,
5315, Dansher Road,
La Grange, IL 60525.

Spitz. Richard J., Inc.
73 Washington Avenue
Brooklyn, NY 11205.

Von Scheven, Inc.
210 California Street,
San Francisco, CA 94111.

Yen.M. Phil. Inc.,
799, Broadway,
Suite 434,
New York, NY 10003.

Sink & Triest Company, Inc.
Post Office Box 321,
30 Commerce Drive,
Montgomeryville, PA 18936.
Jamaica, NY 11432

Lovelette & Associates, Inc.
2380 United Lane
EUK Grove Village, IL 60007.

Mako, Rudy
82 Wall Street
New York, NY 10005.

Manheimer, J., Inc.
35-02 48th Avenue
Long Island City, NY 11101.

contd.

Marmorek, Herbett & Son
Post Office Box 36
2153 78th Street
Brooklyn, NY 11214.

Mercantum Corp.
225 Broadway,
New York, NY 10007

Mueller, Ludwig Co., Inc.
21 West Street
New York, NY 10006.

McLintock, W.L. Co., Inc.
214 Front Street
San Francisco, CA 94111.

Produce Dealers Corp.
Affiliated With Walter I.,
Willner Company, Inc.
11 Broad way,
New York, NY 10004.

Sayia, A.A. & Company, Inc.
Post Office Box M9
One Newark Street,
Hoboken, NJ 07030.

Schliehting, Harry
170 Broadway,
New York, NY 10032

Scott, E.L. & Company, Inc.
One World Trade Center,
Suite 2347
New York, NY 10048

Sennhauser, E.H.
145, Fourth Avenue
New York NY 10003.

UHE, George Co., Inc.
76 Ninth Avenue
New York, NY 10011.

(Economics Times 22nd October, 1981; p6)

86 Trade enquiries

Saleh Mohd. K. Al-Muttawa, P.O. Box. No. 2885, Sofat, Kuwait, Arabian-Gulf, desires to import foods and food products, cooking oils, bottled and canned beverages and soft drinks and mineral water.

(Industrial News Digest 4(11); 1981; 15)

FOOD REGULATION, QUALITY CONTROL AND HYGIENE

REGULATION

87 Irradiation - New U.S. Policy

The Food and Drug Administration is reported to be considering a new policy to facilitate the use of radiation to preserve foods.

Current interest in the use of irradiation in place of chemicals to preserve and extend the shelf life of foods has prompted FDA to consider new and simplified procedures to allow manufacturers to prove that entire categories of foods can be preserved safely through irradiation.

The agency is seeking comment from manufacturers, scientists and the public on the following.

A proposal to permit the use of irradiation of any food at a dose level upto 100 kilorads to destroy insects in wheat, rice, corn, fruits and vegetables. Manufacturers could use this level after proving to FDA through a registration process or a limited approval system that their process is effective.

The publication of technical guidelines to help manufacturers demonstrate to FDA through short term animal feeding studies and other biological tests that food irradiated between 100 kilorads and one megarad are safe. This level, if found to be safe, could be used to destroy bacteria that cause food poisoning in such perishables as meat, poultry and fish and thus extend their shelf life.

Classifying as safe, with minimum testing, the use of irradiation below 5 megarads -1000 kilorads is a megarad - for dried peppers, cloves, oregano and other spices.

Foods irradiated at these three levels do not become radioactive when treated. Most of the energy from the source passes through the food, much as microwaves pass through food in an oven.

Under present procedures, manufacturers must submit safety data to FDA showing that the irradiation of a specific food possesses no health hazard.

The FDA has approved the use of irradiation for the limited purpose of destroying sprouts on potatoes and insects in wheat and flour.

There has been no commercial use of irradiation for these limited purposes.

By law, manufacturers must prove to FDA that their use of radiation to preserve food is safe.

In conjunction with public comment on this proposal, the agency is releasing a report on food irradiation which focusses on how the safety of irradiated foods can be evaluated scientifically.

(Food in Canada 41(6); 1981; 41)

8 GRAS food additives probably are safe

Most additives on FDA's Generally Recognized as Safe (GRAS) list actually have been found to be safe by a special committee. Completing the first scientific review of all the 415 original ingredients on the 21-year-old list, a select panel from the Federation of American Societies for

Experimental Biology has declared that 305 of the compounds are safe in their present use and for foreseeable future uses. Another 68 are safe at least at their present use levels. The panel gave conditional approval to the other ingredients. Some, such as caffeine, are thought to need additional study to answer unresolved questions. Others, such as salt and some modified starches, might have to have limits put on their use, the panel says. The study was started because the removal of cyclamates from the list in 1969 caused concern about the safety of other ingredients listed.

(*Chemicals & Engineering News* 59(2); 1981; 17)

89 FDA approves sterilizer

Tetra Pak Co. Ltd., of Canada has announced that the U.S. Food and Drug Administration has issued a regulation providing for the safe use of hydrogen peroxide and heat as sterilizing agents for the food contact surface of packaging material.

(*Food in Canada* 41(3); 1981; 13)

90 Prevention of Food Adulteration (Second Amendment) Rules 1981

1. (i) These rules may be called the Prevention Food Adulteration (Second Amendment) Rules, 1981.

(ii) They shall come into force on the date of their publication in the official gazette.

2. In the Prevention of Food Adulteration Rules, 1955 (hereinafter referred to as the said rules), rule 44, in clause (j) for the words "prepared from raw and untreated milk/skimmed milk" the words "not prepared from boiled, pasteurised or sterilized milks" shall be substituted.

3. In Appendix B to the said rules :

(i) in item A. 11.02.04 in the second paragraph, the words "other than skimmed milk dahi" shall be omitted.

(ii) in item A. 11.02.07, A. 11.02.07.01 A.11.02.10, A 11.02.11 A 11.02.12, A.11.02.13, A. 11.02.16 and A 11.02.19, the words and figures "with a degree of polymerisation upto 6 units" shall be omitted:

(iii) in item A. 11.02.14:

(a) the words and figures "with a degree of polymerisation upto 6 units" shall be omitted.

- (b) for the words and figures "E. Coli shall not exceed 90 per gram or", the words, figures and the letter "Coliform Count shall not exceed 90 per gram. E. Coli shall be absent" shall be substituted.
- (c) the words and figures "Coliform Count for the powder shall not be more than 90 gram shall be omitted.
- (iv) in item A.11.02.15;
 - (a) the words and figures "with a degree of polymerisation upto 6 units " shall be omitted.
 - (b) for the words and figures "E. Coli shall not exceed 90 per gram" the words, figures and letter "Coliform Count shall not exceed 90 per gram. E. Coli shall be absent", shall be substituted.

(Gazette of India - Extraordinary - Part II, Section 3; sub/section (i) September 1, 1981; 1510)

QUALITY CONTROL

1 Frozen food quality

The majority of American consumers think the quality of frozen food is high, according to a recent national survey sponsored by the American Society for Quality Control (ASQC).

The survey was conducted to determine public confidence in the quality of American products. The findings are based on a statistically projectable sample comprised of the heads of 7,055 American households who were surveyed in October 1980.

Frozen foods were one of the seven products and services consumers were asked to rate. About 58% rated frozen food quality high. In comparison, the quality of drugs/pharmaceuticals was rated high by 67.3% of the public, while 17.6% rated automobile quality high.

Overall, the study shows that nearly half (49.9%) of the public feels the quality of American products and services in general has declined over the past five years. More than half (59.3%) expect that product quality will remain at the same low level or continue to decline in the next five years. More than three-quarters of the population (75.7%) believe that the quality of imported products is equal to or better than American-made products.

Generally, people who are better educated, better paid, and older tend to have more negative opinions according to the survey. However, younger consumers tend to be less positive towards frozen foods than their elders.

According to the study, industry's concern for profits is seen as a major factor in the decline of American product quality. An uncaring workforce and the state of the economy are also viewed as factors.

The study is part of a national campaign by ASQC to stimulate a united effort by business, labour, and government to improve the quality of US goods and services.

(*Food Technology* 35(3); 1981; 115)

HYGIENE

92 Health effects of cooking with gas

The clean-burning virtues of natural gas have been extolled for years. But it now appears the indoor air pollution, gas cooking ranges produce, may be affecting the respiratory health of their users. Below-normal pulmonary (lung) function was shown to correlate with the use of gas ranges in two studies presented in Amherst, Massachusetts at an International Symposium on Indoor Air Pollution, Health and Energy Conservation.

What makes the studies interesting is that one shows effects in adults - previous studies concentrated on children and that the other contradicts the common "wisdom" that a range's nitrogen-dioxide (NO_2) output is responsible for observed respiratory problems.

NO_2 forms during high-temperature combustion, and five studies have shown that average indoor concentrations may be at least five times higher than outdoor NO_2 levels. Since it had been established that lung-tissue damage and increased infection rates occur among persons exposed to NO_2 at very high levels - those far exceeding levels normally encountered in gas-cooking homes - many researchers therefore assumed NO_2 is responsible for the adverse health effects that had been reported.

Richard Letz, John Spengler and colleagues at the Harvard School of Public Health as part of a larger survey, studied both the NO_2 levels in 137 gas cooking homes and the lung function of 190 children dwelling in them. They found that all other factors being equal, children in homes using electric ranges have slightly higher lung function than children in

homes with gas cooking.

Shoring up the contention that gas range affect respiratory function is a study by Kund Helsing, Melvyn Tockman and colleagues at the Johns Hopkins University. Their research - involving 1,950 adults in Washington - measured the apparent relative risks posed to non-smokers by tobacco smoke and gas-range emissions. And the results are clear. There is a definite, unquestionable, statistically significant risk (of respiratory problems) associated with a history of gas cooking.

(PTI Science Service 1(7); 1982)

93 Hope for diabetics

A research team at the University of Tasmania in Hobart is trying to isolate and identify a chromium compound present in brewers' yeast which could help people suffering from diabetes.

Like many other living creatures, human beings need small amounts of certain elements, including chromium, in their diet. But the body needs the chromium in an organic complex form, called the glucose tolerance factor (GTF) and not in a simple metallic state. As people grow older they are sometimes unable to convert the chromium to GTF, which assists the action by insulin in the body, and can lead to the onset of diabetes. By determining the structure of the GTF compound, the Australian team is hoping it can be introduced directly into the diet of diabetics to help alleviate the disease. Of course, this would not help juvenile diabetics - people who have no insulin in their system and need injections to treat the disease. However, it would help people suffering with maturity onset diabetes - those who have lost the ability for various reasons such as obesity to produce insulin.

(The Hindu November 18, 1981; 19)

TRANSFER OF TECHNOLOGY AND NEW INDUSTRIES

4 Home and village prepared weaning foods project

A project to assist countries with the development of home-and village-based weaning foods has been initiated by the MIT/Harvard International Food and Nutrition Program (IFNP) through a three-year grant from USDA/USAID. The purpose of the project is to provide assistance to developing countries and to private voluntary organizations in the development and promotion of locally produced food supplements for weaning-

age children and pregnant and lactating women.

The project's goals focus on :

-- Collection and dissemination of information about the best local approach to improving the feeding of weaning-age children and expectant or breast-feeding women. An archive of literature in the field is being assembled which will be available to countries and programs through a computerized print-out of abstracted literature, review summaries, and reports of successful programs.

-- Provision of technical expertise in response to requests for assistance in designing, implementing, and evaluating programs that will improve the nutritional status of weaning-age children and pregnant and lactating women. Specific requests will be met by consultants selected from an international panel.

-- Demonstration of practical ways of integrating such programs into local health programs using local personnel and resources and appropriate technology. Responses to appropriate requests at no charge.

(League for International Food Education Newsletter September 1981; 3)

95 Dry packed green pepper

Dry packed green pepper is used in many of the European countries for flavouring and garnishing food dishes and is preferred to black pepper because of its freshness and natural aroma. Dry packed green pepper (undehydrated) has superiority over dehydrated green pepper with respect to texture, freshness and appearance. The process developed involves cheaper packaging (in flexible packages) in moist condition without any covering liquid as in canned or bottled green pepper.

Land and building	- Rs. 0.3 lakhs
Plant and machinery	- Rs. 0.25 lakhs
Working capital	- Rs. 1.01 lakhs
Cost of production	- Rs. 12.50 per kg.

(Technology Awareness Service 6(4); 1981; 64-65)

96 Postharvest documentation service

The Postharvest Documentation Service (PHDS) has assembled a collection of non-copy righted documents, journal articles and reports covering all phases of harvesting and postharvest information on cereal grains with emphasis on technology for developing countries.

Information on harvesting, storage, processing, marketing, and controlling postharvest losses of cereal grains and legumes is available free of charge to researchers, administrators, and U.S. Government agencies in the developing countries which are eligible for U.S. foreign assistance. Services will be provided to other individuals at minimal cost.
(*League for International Food Education June 1981; 2*)

97 Technology transfer cell

The Department of Science and Technology is going to set up a national franchising corporation to locate technologies at home and abroad and also aid their transfer.

The franchising corporation would take the advantage of centralizing buying of technology, and would assure that Indian exporters, especially medium and small, remained on par with world technology in the export field. The corporation could confer franchising status on large manufacturers and exporters and exporting house. It should be the responsibility on these large exporters to link up with the small exporters and guide them.

(*Industrial News Digest 4(11); 1981; 17*)

98 Intermediate technology services

Intermediate Technology Industrial Services (ITIS) is a unit of the Intermediate Technology Development Group. It has been set up to provide technical and financial assistance to meet the needs of developing countries for unfamiliar or new technologies, primarily in the small industry sector. Their objective is to assist in creating more places of work in developing countries through the establishment of production facilities using local resources to meet local needs. To achieve this goal, ITIS provides information about existing technologies and carries out studies to determine which technologies may be most appropriate. More importantly, they also provide funds to field test new technologies in developing countries and in the installation of new equipment. ITIS can answer enquiries about existing technologies for specific small-scale industrial activities; recommend sources of supply for machinery and equipment; identify the requirements for new products or processes through field visits by technical experts and market studies; assist with the adaptation of existing technologies and the development of new technologies; and provide

funds to field test and demonstrate new technologies in developing countries. The services of ITIS are available not only to Government departments and development agencies but also to private voluntary organisations and individuals. ITIS can assist anyone who is concerned with the establishment of small industries in developing countries.

(Protein Foods and Nutrition Development Association Newsletter No.36; 1981; 1)

99 13 Lakh tonnes more capacity

The Government plans to install an additional sugar production capacity of 12.93 lakh tonnes during the current financial year. This includes 4.23 lakh tonnes capacity in 27 new sugar factories which have yet to be set up and 8.70 lakh tonnes capacity in 86 expansion schemes. Out of the 27 new sugar factories still to be implemented, 25 are in the cooperative sector, one in the public sector and one is in the private sector.

It is expected with the installation of this capacity the total licensed capacity in the country will touch 76.40 lakh tonnes. Currently the installed capacity for sugar production is 63.13 lakh tonnes.
(N.S.I. News No.16/17; 1981; 10)

100 New credit scheme for small units

A new credit guarantee scheme has been introduced from April 1, 1981 for small scale industries by the Deposit Insurance & Credit Guarantee Corporation, a wholly owned subsidiary of the Reserve Bank of India. According to an announcement made by the Corporation, all credit guarantee schemes would be interested from April 1 onwards under DICGC in order to facilitate effective coordination and operational flexibilities. So far, the credit guarantee scheme for small industries was administered by the credit guarantee organisation within the RBI on behalf of government.

(Spices Newsletter 15(7); 1981; 3)

PERSONALIA

101 Energy panel formed

In addition to SACC (see FD 4(3);1981;141), a Commission for Additional Sources of Energy (CASE) has been formed and will be entrusted with the responsibility of planning and implementation of programmes for development of new and renewable sources of energy.

CASE will be headed by Prof. M. G.K. Menon in his ex-officio capacity as Secretary to Department of Science and Technology. The other members are Secretary to Department of Power (Mr. D.V.Kapur), Secretary to Department of Expenditure (Mr. V.B.Easwaran), Director General of Indian Council of Agricultural Research (Dr. O.P.Gautam) and Mr. A.M. Thomas, Chairman of Khadi and Village Industries Commission.

The functions of CASE are: (A) Formulation of policies and programmes for development of new and renewable sources of energy; (B) Coordination and intensification of research and development activities in new and renewable sources of energy; and (C) Ensuring implementation of Government's policies in regard to matters concerning new and renewable sources of energy.

The Government resolution said in recent years there had been a significant and continuing increase in the price of oil and also uncertainties about its availability on a guaranteed and steady basis. It was therefore important to develop all the indigenous sources of energy in India.

Apart from expanding conventional sources, new and renewable energy sources like solar, wind and biomass were of particular interest for supplying the energy needs of the decentralised and rural sectors, as well as several potential industrial users.

(The Hindu 13th March 1981)

RAW MATERIALS

Nil

STORAGE AND INFESTATION CONTROL

102 Insulated tiffin carriers

Hotline tiffin carrier is for use of office-goers and school children to carry food/snacks for lunch. It is reported that food cooked early in the morning remains hot and tasty for lunch. The Wonderfoam Insulated carriers are available in 2 sizes. Hotline No. 10 has 4.8 litre capacity, 4 aluminium tiffins, or 3 plastic Klik-Fit tiffin with aluminium inner and plastic *chapati* tray. Hotline No.8 has 2.5 litre capacity and 4 aluminium tiffins.

(*Industrial Products Finder* 9(9); 1981; 14)

103 Insulated plastic tumbler

Milton Plastics's Kool Kup is a tumbler made of tough, resilient plastic and is insulated to keep the liquid hot or cold for eight hours. It contains 1.5 standard glass tumbler's of water, juice or hot drink. It features a lock-ring to prevent accidental spillage, and dribble-proof drinking lip. The flow of the content starts when a lever is pressed and stops as it (lever) is released.

(*Industrial Products Finder* 10 (Annual number); 1981; 435)

104 Temperature controlled transport

A new temperature controlled body system for commercial vehicles which can be assembled by semi-skilled workers in less than 12 hours has been developed by container specialist Concargo, a member of the BTR Group. Designed Permacold, the modular system meets all existing and prospective international regulations governing thermally insulated transport, and is designed to suit all popular chassis. Concargo supplies Permacold off-the-shelf as a flat-pack complete with all the items required to assemble the body up to the point of machinery fitment and sign-writing. The system is based on an improved design of lightweight panels which comprise two flat-finished GRP (glass reinforced polyester) skins sandwiched with PIF (press

injection urethane foam). PIF, says Concargo, offers a standard of thermal efficiency unsurpassed by any other insulation materials, and tests on the Permacold panels indicate a reduction of as much as 10% in the co-efficient of heat transfer. In addition to offering superior insulation characteristics, the new panels are also 20% lighter than standard GRP/plywood panels.

The system is also available to users who may not own their own body building workshops.

(Food Flavourings, Ingredients, Packaging and Processing 3(9);1981; 55)

105 Economical insect control system

Mini-Flydowner is a battery-powered ULV (ultra low volume) insecticide sprayer for space, surface and animal spraying. It reportedly destroys both flying and crawling insects quicker, more efficiently and more economically than conventional hand-pumped atomiser sprayers, knapsack sprayers and aerosol cans. A range of oil-based insecticides for use with the sprayer is available, offering users a complete insect control system.

(Industrial Products Finder 9(12); 1981; 105)

FOOD ADDITIVES

106 Cocoa substitutes in ice cream

Some of the cocoa substitutes and extenders currently available were examined and the degree of usage to replace cocoa in chocolate ice cream was determined. After screening at 20-50% substitution levels, one product (a carob powder) was selected for further studies, with emphasis on a substitution level of 50%. In evaluations by about 60 untrained panelists, differences were found between ice creams flavoured with cocoa and those flavoured with cocoa-plus substitutes. Carob proved to have the best combination of flavour and functional properties which resembled more closely those of cocoa than those of the other substitutes tested according to a paper published in Modern Dairy. However, the use of the carob powder affected also the body and texture but these effects could be largely eliminated by adjustments in mix composition.

(Indian Dairyman 33(6); 1981; 402)

107 Corn-derived sweetener with many properties

A family of spray dried hydrolyzed carbohydrate ingredients made from corn offer food technologists a wide range of property variations including extremely low to moderate sweetness, low to moderate hygroscopicity, smooth mouthfeel and palatability, control of freezing point depression, body, texture and sweetness, and excellent solubility in concentrations up to 50% for the 10 D.E. product. Maltrin from Grain Processing Corporation (GPC) can be used in many applications such as beverages, wet and dry non-dairy mixes, spray dried products including orange juice, coffee whiteners and sauces, as well as soups, spreads and gravies.

(Processed Prepared Food 149(4); 1980; 126)

108 Concentrated berry flavour

A natural berry flavour, No. 7550 from Stepan Flavors, is not descriptive of any particular berry, but does have a general berry character. It is used at levels between 0.2 and 0.5% depending on the product and is stronger than many other berry flavours. No. 7550 can be used to enhance flavours in products such as preserves or it can be used alone to provide a fresh berry flavour in beverages and desserts.

(Processed Prepared Food 149(4); 1980; 126)

PROCESSES

109 Stabilization of rice bran

Western Regional Research Centre (WRRRC), USDA, has been successful in stabilizing rice bran by deactivating enzymes causing free fatty acid (FFA) formation. Enzyme inactivation was done by extrusion cooking. An unmodified Brady Crop Cooker was used to extrude the bran. At central valley California climatic conditions, rice bran contains only 10-11% moisture, therefore water equivalent to a 2% increase in moisture was added to the bran as it entered the extruder. Extrusion temperature was 130 C, and the extruded bran was held on an insulated conveyor belt 3 minutes prior to cooling with counter current, ambient air.

Storage of stabilized bran in cloth bags at 32 C and 85% RH for 28 days resulted in oil with 4% FFA, an increase of 1% from the original level. Raw bran stored under the same conditions yielded oil with 51% FFA.

Other benefits of extrusion cooking were reduction of microbiological counts to very low levels and physical transformation of the bran from a fine powder to small flakes. Composition of the extruded bran was 19-22% oil, 13-15% protein and 7-8% crude fiber. The stabilized bran flakes are an excellent substrate for extraction of edible oil which shows potential as a food ingredient. (For earlier research work see Food Digest 4(4); 1981; Item 284)
(*LEC Newsletter* 6(1); 1982; 1)

110 Dried milk products for healthy infants

A method for the manufacture of dried acidophilus products for feeding infants from a few days post partum to 1 year was developed at Nauchno-issled, Inst. Molochnoi Promyshlennosti, Moscow, USSR. It involves the preparation of acidophilus milk base from severely pasteurized whole or skim milk by concentrating 75% of the milk to 44-46% TS in the manufacture of a skim milk type and to 48-50% TS in the manufacture of a whole milk variant. The remaining 25% of the milk is evaporated to 18-20% TS, inoculated with 3-4% *Lactobacillus acidophilus* starter and incubated at 38-40 C to pH 4.3-4.0, whilst the other milk portion is mixed with cream, maize oil and fat-soluble vitamins at 46-50 C and the mixture is homogenized. The 2 portions are then mixed together with the addition of maize starch, the blend is held for 40-60 min. at 40-45 C to bring the pH to 4.4-4.3 and is spray-dried. The product is then mixed with sugar, maize amylopectin phosphate starch as a swelling agent, vitamin B₆ and nicotinic acid. The counts of acidophilus bacteria range from 250,000 to 1.1 million/g of the finished product.

(*Indian Dairyman* 33(6); 1981; 403)

111 Whey wine-making process

A process to produce a dry, white wine from cheese whey has been developed by Frank V. Kosikowski, Professor of food science at Cornell University, in collaboration with Polish scientists. The process uses whey concentrates and a highly active yeast adapted at Cornell. The yeast ferments the lactose present in the concentrate to produce a wine with a minimum 10% alcohol content. As much as 14% alcohol can be produced from the residual lactose of the whey concentrate.

According to Kosikowski, turning cheese whey into wine recycles a potential pollutant. Because the wines produced are relatively inexpen-

sive, they may have a place in the wine market. A bottle of whey wine reportedly costs less than half as much to produce as a bottle of grape wine.

The process begins with the addition of water to the whey powder. Proteins are removed by an ultrafiltration technique, forming a nutritious protein concentrate by-product, and the minerals are removed by an electrodialysis process. The resulting lactose-rich liquid is then fermented for about a week by adding a specially-adapted lactose fermenting yeast. Turbidity is prevented by using bentonite, and citric acid is used to maintain the wine's acidity. The wine is then aged to produce a clear, pale-yellow, tart, dry wine. If the wine is baked at 65 C for two to three weeks, it becomes sherry-like with an amber colour. It can also be distilled and aged to produce a brandy.

(*Food Technology* 35(5); 1981; 46)

112 Coconut cream

Coconut cream or "Gata", the white extract of ground coconut meat, is popular for its rich vegetable fat. A mechanised process has been developed for canning gata which can be kept for at least a year. It involves the continuous extraction of the cream by means of a screw-type expeller. The cream is then pasteurized for 15-30 min. and mixed with a stabiliser before blending and heating to boil. The tin cans are sealed immediately after receiving the boiling cream and sterilised. The whole process is patented under Philippines Patent No.5632.

(*Technonet Asia Digest*, October 1981; p 11)

113 Simple method to process pepper

A simple technique for processing pepper, by which the drying time can be reduced by two days has been suggested by the Agriculture Department (Trivandrum). The technique involves dipping the berries in boiling water for one minute. A bamboo basket may be used for dipping the berries after which they may be taken out and dried completely. The treated berries are then spread for sun drying on clean surface. This will give the produce a uniform shining. This technique also reduces contamination to a considerable extent.

(*Indian Express*, January 22, 1982)

114 White pepper powder from black pepper

India's potential for exporting white pepper which is a value-added product could be substantially improved if a new process developed by the Regional Research Laboratory (RRL), Trivandrum, for producing white pepper powder from black pepper is commercially exploited. India's annual export of white pepper amount to only about 6 tonnes as against about 125 tonnes of pepper oleoresin and about 21,000 tonnes of black pepper. It is estimated that about 10,000 tonnes of the world's pepper production is in the form of white pepper, Indonesia and Malaysia being the principal producers.

The country's low contribution to export market in white pepper is because of not allowing pepper berries to ripen in the plant itself to avoid losses through falling berries. The skin of ripened pepper peels off easily. An alternative traditional process used in Indonesia, Malaysia and to a very limited extent in India is by retting or steaming black pepper followed by abrasion. However, in this process there is a weight loss of about 20 per cent corresponding to the skin. The process developed by RRL, Trivandrum consists of dry-grinding black pepper and subjecting the powder to fractional separation. Through this process, white part of the black pepper can be marketed as white pepper powder and the residual black skin can be used for extraction of pepper oil and pepper oleoresin.

(PTI Science Service 1(6); 1981)

115 Process to purify natural pigments developed

An ultrafiltration and reverse osmosis process to purify and concentrate the pigments extracted from many fruits and vegetables has been developed by Robert C. Wiley, Professor of Horticulture at the University of Maryland Agricultural Experiment Station. The procedure, which is basically a pressure filtration process, is designed to separate compounds on the basis of molecular weight and various polar effects. For example, in table beet juice, sucrose has a molecular weight of 342 while the pigments, called betalaines, have molecular weights of more than 500. When the liquid is extracted from the beet, it passes through a filter that separates it, allowing the sucrose to flow through while collecting the desired pigments.

The extracted juice containing the pigments is somewhat diluted and has a beet-like flavour and aroma, but the ultrafiltration and reverse osmosis process concentrates the pigments, eliminating most of the undesired

flavour and aroma. Because it is a filtration process and does not involve a change in state, the procedure is expected to result in energy savings. Wiley began his research by developing a solid-liquid extraction process for obtaining red dye from beets using equipment developed by a Danish firm to recover juice from apples and sugar from beets. After visiting Denmark, he was able to obtain a small version of the extracting machine for his research.

To extract the colour, the beet is sliced thinly and then dropped into an acidified liquid that release the pigment. In his research, Wiley was able to recover about 90% of the beet's colour. This compares with 45-50% recovery rates using the pressing process which squeezes the juice out.

(*Food Technology* 35(4); 1981; 34)

116 Oxalic acid

A process to manufacture oxalic acid from the barks of terminalia species has been developed at Forest Research Institute & College, Dehradun. The know-how is available for commercial exploitation.

(*Industrial Products Finder* 10 (Annual number); 1981; 347)

BYPRODUCTS AND WASTE UTILIZATION

Nil

PROCESSED PRODUCTS

117 Dairy products for children

A new department for the manufacture of products for children was taken into operation at the Riga Dairy Combine, USSR, in June, 1979. Three types, i.e. kefir for infants, sweetened kefir for infants and cream with 10% fat, are manufactured at present, using the following method for the kefir; severely pasteurized milk (at 85-90 C for 15-20 min.) is cooled to 20-24 C, inoculated with 3-4% kefir starter, filled into graduated 200 ml glass bottles and incubated at 20-24 C. The product is then cooled in refrigerated stores. It should comply with the following requirements: acidity, <110°T; fat content, 3.2-4.2% (the milk is not fat standardized); SNF, 8.0%; sucrose, 5%; and coliform titre >3 ml.

(*Indian Dairyman* 33(6); 1981; 402)

118 Whey protein concentrates

Lacprodan-80, -60, and -35 - may be used in infant food, dietetic products, and meat products. The concentrates offer undenatured protein at levels of 80, 60, and 35% with such features as the ability to form gels, whippability, fat and water binding capacities, and bland or neutral flavours. The products, which are produced by ultrafiltration and spray-drying, are free-flowing powders, and reportedly have excellent solubility over a wide pH range. They also offer high Protein Efficiency Ratios (PER), and therefore they may be used to fortify or supplement other protein sources with lower PER values.

(*Food Technology* 35(4); 1981; 92)

119 Liquor and ice cream mix

An ice cream mix composed of 10% fat, 11.5% milk SNF, 13% sucrose, 4% maize syrup solids (42 dextrose equivalent), 0.3% gelatin, and 0.15% glycerol monostearate was used in this experiment investigating the feasibility of the production of alcohol-flavoured ice cream. Three types were used (by vol.) as follows: creame de menthe at 9% alone or at 3.2% plus 0.2% flavour; brany at 6.5% alone or at 2.4% plus 0.5% flavour-and rum at 9% alone or at 2.4% plus 0.5% flavour. Both freezing point and av. penetrometer readings decreased with increasing amounts of alcohol added. In evaluations by about 50 untrained panelists, the comments on products containing alcohol only indicated that the alcohol contributes to a less desirable body and texture and produces a bitter aftertaste whilst for the products containing alcohol and flavour the comments were generally more favourable according to scientists of Dept. of Food Science, University of Guelph, Ontario, Canada. The identity of the samples was not disclosed and the panelists found it difficult to identify the flavours correctly. It is concluded that with the alcohol levels that may be added legally in Canada, protein destabilization should not be a problem, the fact that alcohol will affect the freezing point and the body and texture of the ice cream should be taken into account, and the alcohol should be added together with an artificial flavour enhancer to obtain a better body and texture and minimize bitterness.

(*Indian Dairyman* 33(6); 1981; 401-402)

120 Improved banana figs: A new village industry

The ripened banana is a perishable commodity. The fetching price at the stage of blackening of skin is very poor due to flooding of market with this commodity and lack of alternatives for its disposal. Jamnalal Bajaj Central Research Institute, Wardha - has developed a simple method of preservable banana figs from ripened bananas. It consists of length-wise slicing of bananas and treating them with clean lime solution for a fixed time interval and then drying them at 50-55 C. The product has good palatability, and shows no deterioration during storage. The sweetness has a lingering quality and it increases with the period of storage. The economic feasibility study indicates that with an investment of about Rs. 2,500, a workable industry can be started in villages. The product can be sold at Rs. 7.50/kg, whereas nutritionally equivalent products are being sold over and above Rs. 30/kg in the market.

(Science for villages. 5(6); 1982; 2)

EQUIPMENT AND MACHINERY

121 Remove fibre from tea

Standard Tea Fibrex is for use by CTC tea processing gardens to remove fibre from tea. It picks fibre (light stuff) from CTC tea after a magnetic field is created around the PVC rollers and cleans the tea thoroughly.

(Industrial Products Finder 10(4); 1982; 135)

122 Vertical helical conveyors

Vibro Technique's helical conveyors with electromagnetic drive are useful for upward transport of bulk material continuously. They are particularly suitable for use where little space is available and drying, heating or cooling of the material is to be done during the process. A double helical base holds the carrier medium such as air or water. There are no moving parts and the material moves up the helix by electromagnetic impulse. The material is deposited at the bottom inlet which goes up the helix around a tubular trough. Using this system, the material can be elevated up to three metres and upto 9 t per hour through feed.

reater heights can be achieved by transferring from one helical conveyor to another.

Industrial Products Finder 9(7); 1981; 27)

123 Power pounding machine

Ajit Home Industries offer slow speed power pounding machines. The machine is provided with a multi hammer unit and is especially suitable for crushing dry hot chilly, dry or wet spices, Ayurvedic medicines, curry masala powder, and hard nuts. Four models are available with 1, 2, 3 and 4 hammers and an automatic sieve. The machine is operated by an electric motor or centrally powered counter-shaft.

(Industrial Products Finder 9(8); 1981; 47)

124 Vegetable slicer

Milton Plastics's Saladex is for slicing vegetables into thin spirals of 8 mm thickness and 1.5 mm width. Apart from radish, carrot, cucumber, turnip, potato, onion and *dudhi*, it is possible to cut certain fruits into spirals. The slicer is operated with a handle, lock and cover.

(Industrial Products Finder 10(Annual number); 1981; 441)

125 Sieving and straining machine

Shrepak sieving and straining machine is for use in the processing industry where there is growing demand for increased purity, fineness and in many cases, uniformity of size. It replaces reciprocating motion by gyratory motion. Gyratory motion results when a solid object moves in a circular orbit without itself rotating. If this orbit is of small diameter and the frequency of movement is sufficiently high, gyratory vibration is generated. The gyratory motion provides advantages of less power requirement and high sieving efficiency. Throughputs range from 15 kg/hour to 9 t/hour, or 50 litres/hour to 65,000 litres/hour with mesh sizes from 4(5,000 microns) to 400 (36 microns). Applications are in processing food products, chemicals, pharmaceuticals, metal powders, minerals, ceramic or refractory materials, latex or resin coatings, paints or pigments.

(Industrial Products Finder 10(2); 1981; 55)

126 Tubular filters permit non-stop filtering

Comark Europe SA report the availability of the Durco tubular filters which can be linked in parallel and provide continuous filtering even during the washing cycle. Any number of standard Durco tubular filters, which are designed for liquid filtration with suspended solid loads from 0.5 to 500 ppm can be connected together on a single manifold to handle flow rates from 2 to 700m³/hour and viscosity range up to 50,000,000 cps. The filters find a variety of applications in the chemical, pulp and paper, food processing, metal-working and related industries, as well as cooling tower water filtrations, final polish filtration, etc.

(Industrial Products Finder 10(Annual number); 1981; 457)

127 Rotary filter screens/spares

Goelka perforated screens with 0.5 mm dia holes are manufactured from non-magnetic stainless steel for cane mud filters and are available in 30 SWG thickness. For rotary vacuum filters, corrugated decker screens are offered. Spares include zig-zag caulking strips in brass, phosphor bronze, and stainless steel; brass horizontal division strips; brass circumferential end-strips/centre division strips; copper drum nipples; stainless steel binder strips; round-head machine screws; adhesive and binding agents; and copper round-head rivets and brake-band rivets.

(Industrial Products Finder 10(Annual number); 1981; 293)

128 Sorting system for teas

Hobro CTC sorting system saves time and labour. Its operation is based on grading of the finer teas first, which in the course of sorting, filter through the coarser grades and form a cushion preventing greying of other teas, by not allowing any substantial contact with the wire mesh, simultaneously effecting the extraction of fibre. The sorter gives fibre-free clean grades, which are ready for packaging or storage. It is available in two models with capacities of 500-700 kg and 700-1,000 kg output per hour, respectively.

(Industrial Products Finder 10(4); 1982; 28)

129 Drum mixer

Pharma Electro Equipments' drum mixer incorporates a cage to hold the drum at a critical inclined plane, which reduces the changes of separation of constituents during mixing when the drum rotates. It mixes, homogenises or disperses small quantities of active ingredients such as chemicals, pharmaceuticals, foodstuff and dyes in powder or granular form. Drums can be changed with minimum physical effort, obviating the need for hoists or other mechanical tackle. The mixer comes complete with a 2 HP, 1,440 RPM motor suitable for 415 V, 3 phase, 50 Hz supply. The gross volume of the drum is 200 litres. Overall dimensions are: 160 cm x 102 cm x 120 cm approximately.

(Industrial Products Finder 10(2); 1981; 14)

130 Tea fibre extractor

Vibro slow speed fibre extractor extracts fibre, and flaky and unwanted portion from tea. The machine is also used as a sorter to obtain different grades such as dusts, fannings and brokens by employing suitable meshes.

(Industrial Products Finder 10(4); 1982; 83)

131 Multi-use drier

A low-cost portable, collapsible copra drier intended for small scale coconut farmers has been developed. It can also be used for drying coffee, corn, peanuts and rice. With slight modifications it can also dry fish and cassava. Made from indigenous materials, it utilizes charcoal derived from the waste coconut husks, thus saving the expense of purchasing fuel.

(Documentation Bulletin No. 45; 1981; 17)

132 Infrared heating

Dynamic Engineers have developed infrared drying equipment which can be used in chemical and food process industries.

(Protein Foods and Nutrition Development Association of India Newsletter No. 46; 1981; 1)

133 Shelf freeze dryer

Shelf freeze dryer, developed by Toshiniwal Brothers (Delhi) Pvt. Ltd., in which heat-sensitive biological materials may be freeze-dried without

affecting their potency or destroying their chemical integrity. It consists of a condenser trap, drying chamber, vacuum system and secondary drying system. It is housed in a welded mobile steel cabinet and is designed for industrial applications.

(*Hindu*, June 23, 1982; 19)

134 Low profile cooker/cooler/mixers

Model JHR cooker/cooler/mixers from Process Equipment Corporation are available in capacities from 60 to 1,000 gallons to provide a flexible approach to various viscous mixing problems. The greater heating and cooling surfaces of these units are designed for such products as mayonnaise, jams, cheese sauces, ground meats, pie fillings and relishes. Some features include swing-away power and drive packages, quick, lift-out agitator assemblies, polished stainless steel construction and various sanitary constructed accessories such as covers, fittings and thermometers.

(*Processed Prepared Food* 149(4); 1980; 50)

135 Solar cooker

Suryamukhi solar cooker is made from corrugated board, aluminium foil and polyester film and cooks rice, *dal*, fish, meat and vegetable, besides baking bread, cake, biscuit, etc. by using direct sun rays. It needs no pressure and has no flame. Utensils are made of black anodised aluminium for absorbing maximum solar heat. The oven temperature reaches 170 C.

(*Industrial Products Finder* 10(Annual Number); 1981; 320)

136 Low-cost heat trap for cooking

The method consists of dividing the process of cooking in two parts -
(a) Bringing to a boil the content to be cooked in the traditional way,
(b) Removing them from the fire and allowing them to simmer in a hay-stack till they are cooked.

(*Documentation Bulletin No.* 45; 1981; 15)

137 New stove with higher thermal efficiency

A wick-less stove has been designed and developed by a scientist. The thermal efficiency of the stove is of the order of 60 per cent as compared

to the wick-stove which has 40-45 per cent thermal efficiency. It has less kerosene consumption of the order of 8 to 9 hours per litre. The quantity of kerosene vapourised is regulated before vapourisation, thereby preventing cracking or formation of carbon particles.

(*Documentation Bulletin No. 45; 1981; 15*)

138 Solar hot water unit

The unit consists of four parallel arrays of flat plate collectors. Each array consists of 12 single and six double glass glazed flat plate collectors with non-selective black-painted absorber and five single acrylic sheet glazed flat plate collectors with selective coating. The system is equipped with thermostatic controls in such a way that hot water at $86 \pm 5^\circ\text{C}$ flows out. The flow of feed water to each array is monitored through rotameters.

(*Documentation Bulletin No. 45; 1981; 15*)

139 Pipe-type solar water-heater

A low-cost, pipe-type, solar water-heater of 100 litres capacity has been designed and developed at Central Building Research Institute, Roorkee. This is a built-in storage type solar water-heater in which eight large diameter pipes of 12.5 litres capacity, each performing the dual function of absorbing solar energy and storing the heated water. The unit has been tested under different operating conditions and is found to be quite efficient if the hot water is utilised during day time. The hot water can also be stored in a separate insulated storage tank for overnight use. The feasibility of this solar water-heater for coupling with electric geyser as a preheater has also been investigated and saving in electrical energy determined under winter conditions. This unit can be easily adopted for use in rural areas, including for preparing the slurry for gobar gas plants in winters.

(*Industrial Products Finder 26(3); 1981; 209-210*)

140 Plodder/extruder

Caps India's plodder incorporates a screw made from high tensile alloy steel, designed for easy, uniform, pulsation-free delivery and high output. The alloy steel barrel is electrically heated using band heaters. The front end includes a full diameter steel gate-way. Cylindrical two-way casing at the feeding end provides water cooling. The drive transmission is through

a heavy-duty worm reduction gearbox coupled to the screw by driving gears and fitted with a bearing-housing enclosing thrust and taper roller bearings with oil reservoir for automatic lubrication. An electric motor with a variable pulley provides different speeds at the screw without having to stop the machine. The plodder/extruder is suitable for extrusion of soaps, pappads or chappatis. Automatic take off and cutting attachment can be provided for pappad and chappati making.

(*Protein Foods and Nutrition Development Association of India Newsletter* No. 36; 1981; 1-2)

141 New dough providing cabinet

The Acrivarn Ltd. new dough providing cabinets have been developed with the modern baker in mind. Claimed fully versatile they achieve top standard of product with uniformity in baking. And designed in unit lengths - each unit holding standard baking racks - different capacities can be catered for. Each cabinet is constructed of insulated panels encased in a stainless steel framework incorporating supply ducts of conditioned air. Consequently, there are no transfer surfaces to the outside of the cabinet and humidity can be achieved without condensation. All the heating air is supplied by a centrifugal fan, driven by a three phase electric motor, mounted on top of the cabinet. The fan produces a quick warm-up of the cabinet with two to three air changes/min. Due to internal design characteristics, even distribution of the heating air "proves" with no variation from layer to layer.

The sophisticated control and straight line indicating equipment, coupled to an electronics cabinet with automatic timer, enables overall control within the cabinet of ± 1 per cent. This alleviates the need for frequent checks on the product inside. The doors of each unit can be swung left or right and are retained by magnetic catches, instead of mechanical parts, for fuel security.

A special feature of the new cabinet is its start-up/warm-up period. At the beginning of a daily cycle, the cabinet is programmed to warm-up prior to steam injection, thus avoiding condensation on colder surfaces. Likewise, at the end of the daily cycle, the machine switches off and steam injection ceases whilst warm air continues for a short period to purge remaining wet humidity.

(*Food Processing Industry* 50(592); 1981; 69)

142 Steam cleaner

Rotex steam cleaner meets cleaning requirements of industries with water saturated steam and/or hot high-pressure water as output. Steam can be used for cutting through the hardest dirt, encrustations, scale and other deposits; for removal of plastic insulation, rust or paint; for degreasing engines; motors, undercarriages; and for sterilizing and disinfecting or sanitizing. Hot high pressure water may be used for cleaning exteriors of vehicles and equipment, machinery, shop-floors, walls and for general maintenance of property.

(Industrial Products Finder 9(11); 1981; 60)

143 Atomisation of thick slurry

Thick slurry with approximately 50% solid contents can be atomized with the help of the Caldyn nozzle CSL. The minimum clearance for slurry flow is kept large enough in order to avoid plugging. Caldyn nozzle CSL employs the property that the sonic velocity in a solid/liquid/gas mixture is only approximately 5% of the sonic velocity in gas. Working with low velocities leads to the low frictional and acceleration pressure losses. The consumption of pressure air or steam is also low. 7,000 kg/h (7 t/h) thick slurry with 37% solids contents can be atomized with a single nozzle CSL employing steam as pressure gas. The specific steam consumption is only 170 kg/ton of slurry at 2.3 ATU (33.8 PSIG).

(Industrial Products Finder 10(4); 1982; 121)

144 Essential oil extraction plant

Hocitril Distillant Co. of Assam manufactures essential oil extraction plants in two sizes with capacities of 500 kg and 1,000 kg, respectively. It is fitted with a condenser, and an automatic full and pilfer-proof oil separator and filler. A double-pass steam generator with over 70% thermal efficiency reportedly provides 35% greater fuel economy than the conventional distillants. Pre-heated water is used for replenishing the steam generator, providing additionally fuel saving. The tilting type still instantly unloads the spent grass, cutting down idle-time, labour-costs, and heat hazards. The lid-lifting device for instant lifting and re-fitting of the cover onto the self-sealing channel seal eliminates the necessity of extra time, labour, pulley block and tackle, as well as unnecessary use of replacement of any form of gasket. The water-seal acts as a safety valve

against excessive steam pressure building up for any reason. The plant does not come within the purview of the Boiler Act and hence there is no need for a licence.

(*Industrial Products Finder* 10(4); 1982; 43)

45 Cryogenic engineering systems

Iwatani & Company Limited of Tokyo, Japan, manufacture compact batch-type freezes utilizing liquefied gases such as nitrogen and carbon dioxide for quick freezing various kinds of foods in small lots. The temperatures to which these foods are subjected are as low as -196 C but the temperature in the freezer can be adjusted from -00 C to -120 C. Carbon dioxide now can be evenly deposited over cartoned foods either on conveyor type continuous equipment or by a transportable, hand-operated machine. Besides these, Iwatani also manufacture a brick type dry ice making machine which converts liquefied carbon dioxide into solid CO₂ continuously.

(*Industrial Products Finder* 9(7); 1981; 16)

46 Aeration under water

The Aire-O₂ aeration system is a motor-driven aspirator pump that induces the flow of atmospheric air below the surface of the water. The air boosts the oxygen level of the water, dissipates surface solids, and eliminates odours. The portable units can be installed as complete aeration systems for new plants or as supplemental, add-on or reserve equipment for existing operations.

(*Processed Prepared Food* 149(4); 1980; 66)

47 Water softener

WTC water softener is for industrial and commercial establishments requiring about 4,000 litres of soft water, an hour. It softens the water by eliminating the hardness-producing elements - calcium and magnesium. Brine is injected into the top of the softening plant by the built-in injector or uniformly distributed over the surface of the exchange material. A built-in auto-control system gives a signal at preset intervals to manually start the regeneration. The softener features corrosion-resistant plastic strainer. It is available in single and double units.

(*Industrial Products Finder* 10(Annual Number); 1981; 45)

148 Texturizing machine

The Village texturizer is a simple machine and an adaptation of a Korean machine used by Korean street vendors to produce snacks. It consists of a press where samples can be heated under pressure for varying amounts of time before the pressure is released. The machine can be built locally in LDC's for \$10-150. The Texturizer is being evaluated in India, Thailand and several countries in Africa for its suitability for texturizing soy.

(*LEC Newsletter* 6(1); 1982; 3)

149 Flask/bottle shakers

Ellefti manufactures a range of flask and bottle shakers to suit individual specifications. The size, shape, provision for number of bottles and flasks, axes, and frequency of movements are tailor made. The movements are smooth due to a sliding cum swivel type bearing at the eccentric shaft and a precision universal joint at the top. Bearings are sealed for protection against laboratory environments like acid or moisture. The shaker is rated for continuous operation for days together. The seat and the neck brackets are padded for safety of the flasks. The shakers are electrically operated, available in fixed or variable speed, and are suited for chemical and analytical laboratories for R&D and production.

(*Industrial Products Finder* 9(7); 1981; 24)

150 Fabrications for food industries

Vishalandhra Industries manufacture a range of equipment for dairy, chemical, pharmaceutical, and foodstuff industries. The range includes: milk chilling units, storage tanks, vessels and vats, and case-in equipment for the dairy industry; and chemical and pharmaceutical equipment such as reaction kettles, cone-mixers, coating-pans, heat exchangers, SS trays, filter funnels, ductings, and vessels with/without agitators.

(*Industrial Products Finder* 10(4); 1982; 141)

151 Food preservation flask

RRL, Bhubaneswar, has developed the know-how for manufacture of food preservation flasks that keep cooked food for a day or two without

freezing, refrigeration or preservative chemicals. It is available for commercial exploitation.

(*Industrial Products Finder* 10(2); 1981; 113)

52 Hot break system for tomato processing

The Viscosor hot break system is a new way to process tomatoes from Langsenkamp. Available in three models to handle 18,30 or 38 tons per hour, the system will produce a thicker tomato juice with no separation problems, according to the manufacturer. The system chops tomatoes in the presence of heat controlled liquid which inactivates the enzymes that degrade pectin. Pectin retention decreases separation and boosts yield by as much as 2.5% or more.

(*Processed Prepared Food* 147(4); 1980; 47)

53 Continuous tea roller

BCTR tea roller helps to convert batch type orthodox tea processing into a continuous process. It reportedly processes about 2,000 kg an hour, which is the output of five conventional rolling tables. The machine, it is claimed, saves: 70% in capital investment and power, 60% in space and 50% and 75% in direct and indirect manpower, respectively.

(*Industrial Products Finder* 10(Annual Number); 1981; 305)

54 Ice cream making machine/plant

Cattabriga SpA, Italy, manufacture a range of machines and plants for small-scale, localised and large-scale, centralised production of home-made and soft ice creams. For producing home-made ice cream, they offer mixers, vertical batch freezer. Mantematic horizontal batch freezer, Kaprice freezer, pasteurising cooling units and cooking and ageing vats. Soft ice cream can be produced by Brio freezer, Futura freezer and Luckypanna. For display and storage of the finished products, Cattabriga manufacture storage vertical and Horizon horizontal cabinets and Igloo refrigerated cabinet. The machinery for large-scale production include: Mix-plant mix-treating plant, Linea 100 continuous pasteuriser and TM and TMA storing vats (all for mix treatment); Freezemat continuous freezer for ice cream production; Polifill, Tortamatic and Icepacks 2000 for ice cream confection; and Eskimoline for stick ice cream. All these can be imported against Actual User's Import Licence.

(*Industrial Products Finder* 10(Annual number); 1981; 201)

155 Manufacturers of solar energy devices and systems in India

<u>Name of Company</u>	<u>Energy products</u>
Advani-Oerlikon Ltd Chinchwad, PUNE.	Solar flat plate collectors Water heating systems
Allied Metal and Engg. Works, 29, Okhla Industrial Est., NEW DELHI 110 020	Solar flat plate collectors Water heating systems
Bharat Solar Energy, A-11, DDA Okhla, NEW DELHI	Solar flat plate collectors Water heating systems
Energy Systems, I.D.A. 23, Balanagar, HYDERABAD 500 037	Solar flat plate collectors
G.S. Jain and Associates, 47/207, Civil Lines, ROORKEE 247 667	Domestic and Industrial solar
Harish Textile Engineers Pvt Ltd. 19, Parsi Panchayat Road, Andheri East, BOMBAY 400 069	Solar water heating systems Windmills Producer gas plants
Hindustan Brown Boveri Ltd., R & D Centre, Post Box No.284, BARODA 390 001	Flat Plate collectors Water heating systems
Jyoti Ltd. Energy Division, Tandalja VADODARA 391 410	Solar hot water systems Solar hot air systems Solar desalination systems Solar low pressure steam systems Steam engine systems Wind energy conversion systems Solar cookers Small hydro units (An annual turn-over of nearly Rs.5 crores is expected by 1984 through sale of solar thermal devices and systems)
Hoist-O-Mech. Ltd., 2nd Pokhran Road, Majiwade, THANE 400 601	Solar flat plate collectors Water heating systems
Roplas (India) Ltd., 145, Bombay-Poona Road, Pimpri, POONA 411 018	Industrial solar water heating system Biogas systems for industrial use
SLM-Maneklal Industries Ltd., Vaswani Mansions, Dinshaw Vaccha Road, BOMBAY 400 020	Solar flat plate collectors Water heating systems

contd.

Name of CompanyEnergy products

contd.

Solar Systems,
14, Girls School Street,
Kumara Park West,
BANGALORE 560 020

Solar water heating systems
Solar driers
Solar cookers

Tungabhadra Steel Products Ltd.,
P.O. Tungabhadra Dam,
TUNGABHADRA 583 225
Bellary Dt., Karnataka

Solar flat plate collectors for water and air heating applications
Domestic, commercial and industrial solar water heating systems. (Solar water heating systems for commercial and industrial applications are likely to constitute 75% of turnover in 1981-82, which is estimated at Rs. 100 lakhs).

(*Energy Digest* 1(4); 1982; 9-10)

PACKAGING

56 Flexible packaging system

Babri Packagings' Stand-Up flexible packaging system can reportedly replace rigid packaging systems with 40% to 50% saving in packaging costs. Stand-Up pouches are flexible bags which can stand up unsupported just like tin cans, glasses or bottles. They are side sealed, gusset bottomed bags manufactured from sealable laminates of various substrates and specifications. Their basic strength lies in the effective cost economies. As against a flat pouch, a stand-up pouch offers up to 25% more filling volume for a given surface area. The pouches are pre-sterilised by intensive ultraviolet radiation. This eliminates the need for pre-fill washing and sterilisation. Shelf life is also increased by the use of in-line gas flushing with nitrogen or any inert gas.

(*Protein Foods and Nutrition Development Association of India Newsletter* No. 46; 1981; 1)

57 Overwrapping system for plastic films

The Hermes-Pester stretch wrapping system contains several models allowing the user a choice of sleeve band wrapping, sleeve stretch band wrapping, sleeve wrap with an end closure and full overwrap (envelope style). The pack sizes and speeds vary with each model and system. Automation is

optional. Generally speaking, the maximum pack size is 760 mm wide x 250 mm high x 500 mm long and wrapping rate varies from 12 packs per minute up to 50 packs per minute. The system allows overwrapping of single packs or collations, and collation preparation stations are also offered as accessories. It is said to be superior to shrink wrapping on account of the better appearance of the product, and the greater economy in scratch wrapping of as much as 30% in film use and 90% in power use. The saving can be greater where the product can be packed in very thin film down to 80 gauge. In fact, the stretch wrapping systems use the common quality of film which is easier to obtain and cheaper than the quality required for shrink wrapping. The system eliminates cumbersome cam drives and enables quick single layer or multilayer collation, reel change, quick product size changes, tension adjustment, safe operation, and dual lane operation. Applications include: packing cartons, bottles and vials made of paper, board, glass or plastic in industries manufacturing cosmetics, pharmaceuticals, tobacco, stationery, engineering goods, coffee, tea, food, fruit, ice cream, confectionery, games/toys, and chemicals.

(*Industrial Products Finder* 10 (Annual number); 1981; 49)

158 Packaging for edible oils

Surlyn from Du Pont Company of USA is for packaging edible oils, vanaspati and ghee. The combination of surlyn with nylon produces a packaging film that resembles polyethylene, but is said to be far superior in strength, sealing and oil protection capabilities. The exterior nylon film of the pouch provides strength and oxygen barrier to prevent rancidity of oil. Polyethylene pouches which are commonly used for milk are unsuitable for oil. The pouches tend to swell and get a high rate of leakage from the sealed joints. Packaging films with Surlyn are said to be approved by the Food and Drug Administration.

(*Protein Foods and Nutrition Development Association of India newsletter* No. 36; 1981; 3)

159 "COBRA" for beverage units

What is claimed to be latest development in filling machines from Crown-Bacle is to be marketed for the first time in the UK by the Machinery Division of the Crown Work CO. Ltd. (Southall, Middlesex). Known as the "Cobra", the machine is a short tube pre-evacuation filler has electronic speed synchronisation of the infeed conveyor, beer pump, high pressure

jetting and Crownes to the filling speed, says the Company. A new valve design is said to allow automatic cleaning of the valve parts during a production run and at the same time cleaning and sterilising of all beverage contact parts.

(*Packaging Digest* 8(1); 1981; 6)

160 Strip-packing machine

Diecraft high-speed fully-automatic strip-packing machine can be used for packing pharmaceutical items such as tablets and capsules; supari, chewing gum, and small bearings in aluminium, glassinepoly or other heat sealable foil. The machine basically consists of a pair of precisely machined heat-sealing rollers through which the foils are drawn. The product to be packed is released at the same time through stainless steel chutes with a timing sequence that is synchronised with the rotary motion of the rollers. The sealed product then passes through a cutting mechanism which severs the foil in predetermined lengths and the finished product is dropped on to a conveyor (custom-built if necessary to suit requirements). Tablets are fed into an electromagnetic vibratory feeder with which the feed rate can be precisely controlled by means of a Dimmerstat. There is complete standardisation of parts so that replacements, if ever required, can be effected in a quick and easy manner. The control panel is of the fully integrated type with well laid-out, clearly visible circuitry sealed off from dust and moisture.

(*Industrial Products Finder* 10(4); 1982; 148)

161 Vacuum and gas flush packaging machine

Polystar machines are for packaging products like cashewnuts and fruit pulp in an absolute air-tight and hygienic way. The goods are protected against loss in weight by gas-tight plastic film. The packing preserves products over a long period. The machine is equipped with a vacuum chamber system. After the chamber is closed, the working sequence proceeds automatically. The single function (evacuating, welding, filling in gas) can be adjusted electronically at the control panel to suit requirements. The impulse welding system reportedly guarantees an air- and gas-tight weld.

(*Protein Foods and Nutrition Development Association of India Newsletter* No. 46; 1981; 2)

162 Liquid packaging machine

Prepac is for hygienic, convenient and economical packaging of liquids such as syrups, liquid detergents, oils, adhesives and chemicals. A roll of heat sealable film is mounted on the rear of the machine. The film is formed into a tube and sealed vertically. One simultaneous operation seals the film tube at the lower edge, fills it, seals at the top and cuts off. Polythene film is sealed and cut with a horizontal sealing electrode. Guillotine or reciprocation knife arrangement can be provided. Various systems are available depending on the type of product to be handled. The entire operation is fully automatic and electronically controlled. (*Protein Foods and Nutrition Development Association of India Newsletter No. 43; 1981; 1*).

163 Filler for whole peeled tomatoes and tender fruits

A new open-style filler by Solbern Corporation achieves "the most gentle product handling ever" for whole peeled tomatoes, pears, peaches, apricots, and similar fruits, according to the company. The new Solbern Model 201 filler achieves precise accuracy of fill and speeds up to 500 cans per minute for No.303 cans. The secret is the patented filling process. Tilted containers are filled gradually while shaking from side to side. Shake motion is controlled at optimum frequency and amplitude to achieve desired density. This causes the product to nestle into position. This simple but unique concept permits precise weight control at high speeds. Only the required amount of product is circulated to fill containers, thus avoiding excess recirculation, which can damage delicate fruit products. The Model 201 filler can be utilized with wide-mouth containers, including metal cans, glass jars, and composite containers. (*Food in Canada 41(3); 1981; 42*)

164 Liquid adhesive

IIC OPS-C liquid adhesive is said to have been designed for good machinability required in the corrugated board manufacturing industry. It possesses excellent tack and can be thinned up to optimum requirements. The adhesive increases the bursting strength of the board. (*Industrial Products Finder 9(7); 1981; 4*)

ANALYSIS

165 Oxygen analyser

Biochem oxygen analyser is a direct readout instrument for measuring dissolved oxygen and temperature. The basic units - a sensor and an amplifier - form the analyser. The sensor detects the oxygen content and the amplifier using integrated circuits amplifies the signal which is directly read on a moving coil meter. Calibration is by the fast air calibration technique that can be completed in seconds. There is also a recorder output for preparing permanent records. The analyser finds application in ecological studies, sewage treatment plants, fish hatcheries and pollution control.

(Industrial Products Finder 10 (Annual Number); 1981; 14)

166 H₂O₂ measurement method

FDA has announced the availability of a method that can be used to measure hydrogen peroxide at the 0.1 ppm level in distilled water when it is used to sterilize packaging materials under simulated use conditions. Details are in the Federal Register of March 20.

(Food Technology 35(5); 1981; 190)

167 Analysis of carbonated beverages

Carbonated beverages may be analyzed for inorganic anions and organic acids using ion chromatography (IC) and ion chromatography exclusion (ICE) for the analysis of inorganic anions and organic acids respectively.

(Food Technology 35(5); 1981; 204)

168 pH recorder

Radart pH recorder is used for continuous indication and recording of pH values. It is portable, has a watertight casing, and operates even in humid environment. The meter is suited for use in water channels up to a depth of 10 metres between 5 and 6 C. A separate model for measurement of pH from -5 C and above is also available.

(Industrial Products Finder 9(12); 1981; 10)

169 Sterilizable pH sensor

A line of steam sterilizable pH sensors has been introduced by TBI of USA. Intended primarily for continuous pH monitoring in food, pharmaceutical and beverage industries, the sensors are applicable to any service where the sterilization cycle is performed with the sensor in place. Sensor construction includes a combination glass electrode with liquid junction of permeable Teflon to resist the effects of oily substances. Pressurization of sensors is not required. Three sensor styles are adaptable to pipeline, tank or fermenter mounting. A selection of four sensor body lengths for vessel mounting is offered as standard, with custom lengths available. All TBI system sterilizable pH sensors are rated to 50 PSIG (3.5 kg/cm²) and 130 C.

(Protein Foods and Nutrition Development Association of India Newsletter No. 46; 1981; 2)

170 Humidity/temperature meter

The KM5001 miniature direct reading humidity/temperature meter is now being distributed by the Electric Tachometer Corporation. The pocket-sized unit reads relative humidity to within $\pm 2\%$ and temperature to within ± 0.5 C and utilizes a 3-digit LED display. A single switch selects relative humidity measurements from zero to 100% or temperature measurements from -9.9 C to 95 C. The KM5001 weighs only 9 ounces and comes complete with case, charger for its internal nickel-cadmium batteries and a spare sensor on a 3-foot cable for measurements in hard-to-reach places.

(Processed Prepared Food 149(4); 1980; 126)

171 Hand sugar refractometer

Electro Scientific Industries offer a hand sugar refractometer to read the refractive indices of sugar solutions. Used by sugar and tinned-food manufacturing units, confectioneries and breweries, the refractometer covers these ranges: 0-32%, 28-62% and 58-90%.

(Industrial Products Finder 10(Annual number); 1981; 245)

172 Radiometric density gauge

ECIL's radiometric density gauge is for the continuous measurement of density of liquids, suspensions, slurries or poured materials. Measurement is without physical contact and is unaffected by changes of measure

flow rate and viscosity. The gauge is used in the manufacture of acids for the control of blending operations, reactions and polymerisation, as well as to measure detergent and other powders. In the cement industry, the gauge can be employed to control the water content of cement slurry before burning and to measure the clinker density. Foodstuff, sugar, petroleum and mining industries are some of the other areas of the instrument's coverage.

(*Industrial Products Finder* 10(Annual number); 1981; 139)

173 Humidity chamber

Biochem humidity chamber is used for carrying out test requiring an atmosphere of controlled temperature and humidity like drying environment for biological samples, investigation of vapour proofness of packaged materials, determination of di-electric strength and insulation tests of electrical components. The chamber interior is made of either anodized aluminium or stainless steel with three removable perforated trays. Both the temperature and humidity are directly set and controlled automatically using thermostat and humidistat. Humidistat eliminates the need for referring to wet and dry bulb chart. The humidity and temperature were read by direct reading hygrometer and thermometer. The chamber is provided with axial air blowers for uniform test conditions. The humidity chamber comes in two sizes and is double-doored with the inner one made of glass for test visibility.

(*Industrial Products Finder* 10(Annual number); 1981; 143)

174 Flour quality analyzer

The Model 102F may be used by the flour miller and baker to measure protein, moisture, oil, and other flour quality parameters. The instrument uses a near-infrared light source to provide reflection data at specific wavelengths. The data converts into direct percentage readings which appear on the digital readout in seconds.

(*Food Technology* 35(5); 1981; 198)

175 Equipment to emulsification/homogenisation

Indian Equipment Corporation's Laboratory emulsifier is suitable for emulsification and homogenisation. The IEC emulsifier is equipped with a 1/8-HP or 1/4-HP universal motor with variable speed regulator for up to a

maximum speed of 12,000 RPM. It is fitted with an impeller type disc which sucks liquid from the sides while the internal rotor with teeth rotates at a high speed, causing emulsification and homogenisation. Contact parts are of stainless steel. The emulsifier is available in capacities of 1 to 10 litres. Bigger sizes can be made to order.

(Protein Foods and Nutrition Development Association Newsletter No. 36; 1981; 2)

COMMERCIAL INTELLIGENCE

PRODUCTION (RAW MATERIAL)

176 All India final estimate of sunflower 1980-81

State	Area (thousand hectares)	Production (Thousand tonnes)

Andhra Pradesh	1.5	0.7
Bihar	0.6	0.2
Karnataka	32.1	17.9
Maharashtra	63.3	39.9
Orissa	1.3	0.7
Rajasthan	0.4	0.2
Tamil Nadu	5.0	2.2
Uttar Pradesh	6.1	4.2
West Bengal	2.0	0.4
All India	112.3	66.4

1. Sunflower crop has been brought on forecast basis for the first time.
2. No information regarding crop estimates is yet available from the Government of Sikkim
3. Sunflower is not grown to any appreciable extent in States/Union Territories not mentioned above.

(Directorate of Economics & Statistics, Ministry of Agriculture, Government of India)

77 All India final estimate of coconut, 1979-80

State	Area (thousand hectares)	Production (million nuts)
Andhra Pradesh	41.3	170.6
Assam	5.1	33.8
Karnataka	166.3	865.5
Kerala	663.8	3208.8
Maharashtra	9.4	57.5
Orissa	20.7	90.1
Tamil Nadu	114.9	1192.2
Tripura	1.1	1.5
West Bengal	6.7	22.0
Andaman & Nicobar Islands	19.5	62.1
Goa, Daman & Diu	18.7	90.0
Lakshadweep	2.8	20.8
Pondicherry	1.6	15.5
ALL INDIA	1071.9	5830.4

1. Coconut is not grown to any appreciable extent in States/ Union territories not mentioned above.
2. No information regarding crop estimates is yet available from the Government of Sikkim.

(Directorate of Economics and Statistics, Ministry of Agriculture,
Government of India, New Delhi)

178 All India final estimate of guarseed (for seed purposes only)
1980-81

State	Area (thousand hectares)	Production (thousand tonnes)
Gujarat	133.3	42.2
Haryana	250.1	143.3
Punjab	51.0	66.2
Rajasthan	1965.4	314.6
Uttar Pradesh	0.6	0.4
ALL INDIA	2400.4	566.7

1. Guarseed is not grown to any appreciable extent in States and Union Territories not mentioned above.
2. No Information regarding crop estimates is yet available from the Govt. of Sikkim.

179 All India estimate of tapioca 1980-81

State	Area (thousand hectares)	Production (thousand tonnes)
Andhra Pradesh	13.0	166.5
Assam	1.3	5.9
Karnataka	1.3	12.8
Kerala	273.5	4058.2
Meghalaya	3.1	15.3
Rajasthan	0.3	0.5
Tamil Nadu	52.2	1539.7
Tripura	0.2	1.0
Andaman & Nicobar Islands	0.2	1.6
Mizoram	0.3	0.8
Pondicherry	0.8	14.9
ALL INDIA	346.2	5817.2

1. Tapioca is not grown to any appreciable extent in States and Union Territories not mentioned above.
2. No Information regarding crop estimates is yet available from Government of Sikkim.

(Directorate of Economics and Statistics, Ministry of Agriculture,
Government of India, New Delhi).

180 All India estimate of potato 1980-81

State	Area (thousand hectares)	Production (thousand tonnes)
Andhra Pradesh	0.3	0.7
Assam	38.2	238.8
Bihar	132.0	1055.0
Haryana	11.4	187.0
Gujarat	12.3	329.9
Himachal Pradesh	14.4	63.2
Jammu & Kashmir	1.7	4.1
Karnataka	11.0	83.2
Madhya Pradesh	23.9	306.8
Maharashtra	10.6	49.7
Manipur	2.0	10.6
Meghalaya	17.3	121.0
Nagaland	4.3	23.4
Orissa	8.1	60.3
Punjab	38.9	750.3
Rajasthan	2.1	3.1
Tamil Nadu	11.1	79.4
Tripura	2.4	35.0
Uttar Pradesh	273.3	4234.1

continued

State	Area (thousand hectares)	Production (thousand tonnes)
West Bengal	115.6	1971.8
Delhi	0.2	1.6
Mizoram	0.9	4.5
ALL INDIA	732.0	9598.5

1. Potato is not grown to any appreciable extent in other States/ Union Territories not mentioned above.
2. No information regarding crops estimates is yet available from the Govt. of Sikkim.

(Directorate of Economics & Statistics, Ministry of Agriculture, Government of India, New Delhi)

181 All India final estimate of turmeric 1980-81

State	Area (thousand hectares)	Production (thousand tonnes)
Andhra Pradesh	29.4	75.4
Assam	8.1	4.9
Bihar	5.7	10.9
Karnataka	2.4	9.0
Kerala	3.8	7.2
Madhya Pradesh	0.4	0.4
Maharashtra	7.7	11.7
Meghalaya	1.3	1.8
Orissa	22.8	31.5
Rajasthan	0.2	0.3
Tamil Nadu	15.1	54.5
Tripura	0.9	1.4
Uttar Pradesh	0.6	0.7
Mizoram	0.1	0.7
ALL INDIA	98.5	210.4

1. Turmeric is not grown to any appreciable extent in States/Union territories not mentioned above.
2. No information regarding crop estimates is yet available from the Govt. of Sikkim.

(Directorate of Economics & Statistics, Ministry of Agriculture, Government of India, New Delhi)

182 State-wise area, production and yield of onion in India (1979-80)

Area : '000 hectares
Production : '000 tonnes
Yield : kg.ha.

State	Area	Production	Yield
Maharashtra	50.5	774.6	15339
Gujarat	17.5	293.5	16771
Tamil Nadu	26.0	274.8	10569
Orissa	36.1	179.7	4978
Madhya Pradesh	11.6	116.5	10043
Karnataka	25.8	163.2	6326
Bihar	14.4	102.8	7139
Andhra Pradesh	16.6	123.0	7410
Haryana	1.8	17.6	9778
Rajasthan	10.7	36.3	3393
Punjab	1.2	17.7	14750
Uttar Pradesh	12.5	156.5	12520
West Bengal	13.9	82.1	5906
Others (E)	11.9	151.7	12748
All India	250.2	2489.9	9952

(E) - Estimated.

(Economic Times February 10, 1982)

183 All India final estimate of banana, 1980-81

State	Area (thousand hectares)	Production (thousand tonnes)
Andhra Pradesh	19.3	359.0
Assam	24.6	319.2
Bihar	9.6	45.0
Gujarat	18.0	394.6
Karnataka	17.5	94.9
Kerala	53.7	663.3
Madhya Pradesh	8.8	217.0
Maharashtra	52.5	1272.8
Manipur	2.2	28.9
Meghalaya	2.9	38.9
Orissa	17.9	155.8
Tamil Nadu	55.5	1216.2
contd.		

contd.

State	Area (thousand hectares)	Production (Thousand tonnes)
Tripura	2.6	16.5
Uttar Pradesh	0.6	2.3
Andaman & Nicobar Islands	1.1	0.5
Mizoram	2.7	0.4
All India	289.5	4830.3

1. Last year's data repeated in the absence of information for 1980-81
2. West Bengal is non-reporting for this estimate.
3. Banana crop is not grown to any appreciable extent in States and Union Territories not mentioned above.
4. No information regarding crop estimates is yet available from the Govt. of Sikkim.

(Directorate of Economics & Statistics, Ministry of Agriculture, Government of India)

84 All India final estimate of arecanut (Arecacatechu), 1980-81

State	Area (thousand hectares)	Production (thousand tonnes) dried nuts without husk (processed nuts)
Andhra Pradesh	0.2	0.2
Assam	50.8	49.8
Karnataka	54.3	79.2
Kerala	60.9	53.2
Maharashtra	2.1	2.5
Meghalaya	6.5	0.9
Tamil Nadu	4.3	3.0
Tripura	0.6	0.4
West Bengal	3.1	0.8
Goa, Daman & Diu	1.4	1.3
Mizoram	0.3	0.1
All India	184.5	191.4

Arecanut is not grown to any appreciable extent in other States and Union Territories.

No information regarding crop estimates is yet available from the Govt. of Sikkim.

(Directorate of Economics & Statistics, Ministry of Agriculture, Government of India)

185 All India final estimate of arecanut (Arecacatechu), 1980-81

State	Production of arecanut dried nuts without husk (processed nuts) (Thousand tonnes)	
	Tender	Ripe
Andhra Pradesh	-	0.2
Assam	4.1	45.7
Karnataka	8.7	70.5
Kerala	3.3	49.9
Maharashtra	-	2.5
Meghalaya	0.1	0.8
Tamil Nadu	-	3.0
Tripura	-	0.4
West Bengal	0.2	0.6
Goa, Daman & Diu	-	1.3
Mizoram	-	0.1
All India	16.4	175.0

(Directorate of Economics & Statistics, Ministry of Agriculture, Government of India)

186 Number of cold stores and installed capacity in relation to potato production

Year	No. of cold stores	Installed capacity	Production (Tonnes)	Installed capacity Production (Percentage)
1976	1744	2126935	7306000	29.0
1978	2072	3060156	9009000	34.0
1979		3500000	10000000	35.0

(Profodcil Bulletin 15(2); 1980; 22)

CONSUMPTION (RAW MATERIALS)

87 Per capita consumption of potatoes

Country	Kg.	Country	Kg.
Austria	124	Italy	43
Belgium	146	Norway	102
Canada	69	Portugal	115
Denmark	132	Sweden	113
France	122	The Netherlands	108
Germany	174	Turkey	30
Greece	38	United States of America	48
India	13	United Kingdom	100

(Profodcil Bulletin 15(2); 1980; 6)

88 Projected demand of potato at various levels of consumption

Year	Population (Millions)	Area (000ha)	Average Yield (per ha)	Supply (000 M.T.)	Per capita consumption (kg.per yr.)
1981	650.63	800	140	11200	13
1991	755.18	1200	180	21600	21
2001	863.99	1500	200	30000	20

(Profodcil Bulletin 15(2); 1980; 9)

EXPORT

89 India's exports of processed foods

Qty. in Tonnes
Value in Rs. 00.000

Items	1980-81		1979-80	
	Qty.	Value	Qty.	Value
Mango Juice	6298.7	353.72	5728.5	372.09
Other canned and bottled fruits	7617.3	612.41	4265.1	288.54
Canned vegetables	1192.0	91.19	1733.5	96.37
Dehydrated vegetables	516.0	79.70	1095.7	139.05
Pickles and chutneys	6090.8	478.49	10517.3	727.98

contd.

contd.

Items	1980-81		1979-80	
	Qty.	Value	Qty.	Value
Frozen meat	37130.8	3294.07	26577.6	2219.50
Canned meat	2512.1	460.55	1916.4	313.56
Poultry products	-	314.93	-	85.74
Confectionery and sweetmeat	148.1	16.59	850.8	62.69
Biscuits	4202.9	351.59	5025.0	371.32
Guar gum	40359.5	3534.65	54052.9	3538.81
Guar meal	1200.9	14.70	19950.2	261.50
Non-alcoholic beverage base	-	0.13	45.2	3.39
Alcoholic beverages	-	113.19	3340697.0	210.62
Wheat bran	843.0	8.57	3731.0	37.88
Malted milk and baby food	927.0	152.47	1404.1	209.80
Butter and ghee	243.3	63.94	296.5	76.62
Starch and its derivatives	14095.7	189.45	20948.8	311.92
Papads	1609.5	150.16	2505.4	221.88
Instant coffee	1192.5	1225.29	879.5	746.35
Instant tea	718.6	393.41	607.7	305.52
Cocoa products	94.2	35.33	331.6	73.04
Walnuts-in-shell	1546.2	150.85	3616.4	387.56
Walnut kernels	2384.6	477.51	4726.4	882.85
Animal casings	-	79.58	384.7	178.17
Mushrooms	22.1	147.83	38.3	224.19
Other processed foods	-	392.22	-	5264.04
Fresh meat, vegetables and fruits	-	4122.50	-	3423.50
Total	-	17305.02	-	16296.48

(Economic and Commercial News 15(2); 1982; 5)

190 Exports of papads from India

Quantity: M. Tonnes
Value: Rs. '000

Year	Quantity	Value
1978-79	1811.2	14280
1979-80	2505.4	22188

(Profodcil Bulletin 15(4); 1981; 63-66)

191 Export of potatoes from India

Qty: M. Tonnes
Value: Rs. 000

Country	1978-79		1979-80	
	Quantity	Value	Quantity	Value
Sri Lanka	3080.0	37.63	6654.5	119.18
Nepal	22282.7	23.93	3557.0	30.06
Malaysia	Neg	-	1480.5	20.18
Singapore	-	-	489.0	9.12
United Arab Emirates	1240.0	14.07	525.9	6.30
Syria	8458.0	84.58	-	-
Kuwait	510.0	6.52	344.9	4.63
Iran	-	-	-	-
Italy	-	-	-	-
Netherlands	-	-	-	-
Portugal	-	-	-	-
United Kingdom	Neg	-	Neg	-
Yugoslavia	-	-	-	-
France	-	-	-	-
Bahrein	Neg	-	Neg	-
Qatar	Neg	-	Neg	-
Mauritius	-	-	400.0	4.80
Total	16033.3	172.16	13984.9	201.40

(Profodcil Bulletin 15(2); 1980; 36-37)

TRADE INFORMATION

192 Trade enquiries received from importers

<u>Name of the Importer</u>	<u>Items of interest</u>
AL TARASIA Trading Company P.O. Box No. 26 Safat Kuwait	All kinds of canned foods
Dhabaanest, Jamiyah Street, P.O.Box 41898 Riyadh, Saudi Arabia	Fresh fruits and vegetables
J.H. Enterprises, Inc., P.O.Box No. 378, West Street, Industrial Park, East Hanover, NJ-07936 USA	Canned food products
Jusfrute Limited, P.O.Box No.25, Gosferd, NSW-2250, Australia	Mango juice
Ahmed Hajee Ismaii, P.O.Box No.32 101 Crater, Aden.	Glucose Biscuits

contd.

Name of the Importer

Items of interest

H & F International S.A.
Avenue Des Fleurs 8,
1150 Brussels, Belgium

Fresh and frozen meat

Amin Qasim Rajmahal,
192, Rue Du Convention,
Paris-15, France

Broken rice

Cehtaurus Trading Limited,
124, Symonds Street,
P.O. Box No.3467, Auckland,
New Zealand

All kinds of processed foods

(Profodcil Bulletin 15(2); 1980; 49)

FOOD REGULATION, QUALITY CONTROL AND HYGIENE

QUALITY CONTROL

193 Prevention of Food Adulteration (Second Amendment) Rules, 1982

G.S.R. 57(E) - Whereas certain draft rules further to amend the Prevention of Food Adulteration Rules, 1955, were published as required by sub-section (1) of section 23 of the Prevention of Food Adulteration Act, 1954 (37 of 1954) hereinafter referred as said Act with the notification of the Government of India in the Ministry of Health and Family Welfare (Department of Health) No. G.S.R. 1191, dated 3rd November, 1980 at pages 2393-2395 in the Gazette of India, Part II Section 3 sub-section (i) dated the 15th November, 1980 inviting objections and suggestions from all persons likely to be affected thereby before the expiry of 90 days from the date on which the copies of the Official Gazette in which the said notification was published, were made available to the public;

And whereas the copies of the said Gazette were made available to the public on, 15th November, 1980;

And whereas the objections and suggestions received from public on the draft rules have been considered by the Central Government;

Now, therefore, in exercise of the powers conferred by sub-section (1) of section 23 of the said Act, the Central Government, after consultation with Central Committee for Food Standards, hereby makes the following rules further to amend the Prevention of Food Adulteration Rules, 1955, namely:-

RULES

1. (1) These rules may be called the Prevention of Food Adulteration (Second Amendment) Rules, 1982.

(2) They shall come into force on the date of their publication in the Official Gazette, except rules 2 and 3 which shall come into force after six months from the date of publications.

2. In rule 42 of the Prevention of Food Adulteration Rules, 1955 (hereinafter referred as the said rules), after subrule (V), the following shall be inserted, namely:-

"(W) Every package of the Dried, Glucose Syrup containing sulphurdioxide exceeding 40 ppm", shall bear the following label, namely :

DRIED GLUCOSE SYRUP FOR USE IN SUGAR CONFECTIONERY ONLY

3. In rule 49 of the said rules, after sub-rule (12); the following shall be inserted, namely:-

"(13) Dried Glucose Syrup containing sulphur-dioxide exceeding 40 ppm shall be sold only in a package which shall bear the label as specified in sub-rule (W) of rule 42".

4. In appendix B of the said rules, -

(i) for item A, 07.04, the following shall be substituted, namely:-

"A. 07.04 "ICE LOLLIES OR EDIBLE ICES" means the frozen ice produce which may contain the permitted flavours, sugar, syrup, fruit, fruit juices, cocoa, citric acid, stabilizers or emulsifiers not exceeding 0.5 per cent by weight. It shall not contain an artificial sweetner".

(ii) After item A. 07.04, so substituted the following items shall be inserted, namely :-

"A. 07.04 - ICE CANDY means the frozen ice produce which may contain permitted flavour, fruit, juices, nuts, cocoa, citric acid, stabilizers or emulsifiers not exceeding 0.5 per cent. It shall contain sugar not less than 10 per cent by weight. It shall not contain any artificial sweetner".

(iii) in item A. 07.5 and A.07.08, after the existing entries, the following shall be added in the end, namely:

"Sodium bicarbonate, if used, for clarification purposes, shall be of Food Grade Quality".

(iv) after item A. 07.10, the following new item shall be inserted, namely:

A. 07.11 DRIED GLUCOSE SYRUP means the material in the form of course or fine white to creamish white powder, sweet to taste, bland in flavour and somewhat hygroscopic. It shall be free from fermen-

tation, evidence of mould growth, dirt or other extraneous matter, or added sweetening or flavouring agent.

It shall also not contain any added natural or coaltar food colour. It shall conform to the following standards:

- (a) Total solid content : Not less than 93.0 per cent by wt.
- (b) Reducing sugar content: Not less than 20.0 per cent by wt.
- (c) Sulphated ash : Not more than 1.0 per cent by wt.
- (d) Sulphur dioxide : Not more than 40 ppm "Sulphurdioxide may be present in an amount not exceeding 150 ppm if the product is intended for manufacture of confectionery to be sold under a label as specified under rule 42(W)";

(v) in item A. 08.01, in sub-paragraph (5) in clause (i) for the words and figures and "shall be not less than 3.0 per cent by weight", the words and figures "and shall be not less than 3.0 per cent and not more than 7.0 per cent by weight" shall be substituted;

(vi) in item A. 14, and A. 14.01, in clause (a) of both items for the entry "50.0 to 8.0 per cent", the following shall be substituted, namely:-

"5.0 to 8.0 per cent by weight on dry basis".

(vii) in item A. 14 in clause (c), for the entry "Not more than 1.0 per cent" the following entry shall be substituted, namely:

"Not more than 1.0 per cent by weight on dry basis";

(viii) in item A. 14.01, in clause (c), for the entry "Not more than 1.2 per cent" the following entry shall be substituted, namely:

"Not more than 1.2 per cent by weight on dry basis";

(ix) in items A. 14 and 14.01 in clause (e) of both items, for the entry "Not less than 1.0 per cent and not more than 2.2 per cent expressed as K_2O ", the following shall be substituted, namely:

"Not less than 1.0 per cent and not more than 2.2 per cent expressed as K_2O on dry basis".

(Gazette of India (Extraordinary); Part II; Section 3; sub-section (i);
February 11; 1982; 122-123)

REGULATION

194 Wheat roller flour mills (licensing and control) amendment order 1982

G.S.R. 50(E) - In exercise of the powers conferred by section 3 of the Essential Commodities Act, 1955 (10 of 1955), the Central Government hereby makes the following Order further to amend the Wheat Roller Flour Mills (Licensing and Control) Order, 1957, namely :

1. (1) This Order may be called the Wheat Roller Flour Mills (Licensing and Control) Amendment Order, 1982

(2) It shall come into force at once.

2. In the Wheat Roller Flour Mills (Licensing and Control) Order, 1957.

(1) in clause 2, -

(a) in sub-clause (c), for the words "State Government", the words "Central Government" shall be substituted;

(b) after sub-clause (d), the following sub-clause shall be substituted, namely:

"(dd) 'specified authority' means an officer appointed as such by the State Government to exercise the powers and perform the duties specified under this Order";

(2) in clause 4,-

(a) for sub-clause (1), the following shall be substituted, namely:

"(1) Every application for a licence under this Order shall be made to the licensing authority and every application for renewal of a licence under this Order shall be made to the specified authority, in Form I."

(b) in sub-clause (2), in item (c), for the words, "Licensing authority" the words "specified authority" shall be substituted.

(3) in clause 5,-

(a) in sub-clause (1), after the words, "Licensing authority" the words, "or as the case may be, the specified authority" shall be inserted.

(b) after sub-clause (1), the following proviso shall be inserted, namely:-

"Provided that if a roller flour mill remains closed for a period exceeding twelve months or the licensee does not get the licence renewed within thirty days of the expiry of the validity of the licence, the specified authority shall forward the

application for renewal of the licence to the licensing authority with its recommendations or otherwise";

- (c) in sub-clause (2), after the words "licensing authority", the words "or as the case may be, the specified authority" shall be inserted.

(4) in clause 10,-

- (a) in the "Heading" after the words "licensing authority" the words "and specified authority" shall be inserted;

(b) in sub-clause (1),-

- (i) after the words "Licensing authority" the words , "or as the case may be, the specified authority" shall be inserted;

- (ii) in the proviso after the words "shall be issued" the words "by the specified authority: shall be inserted;

- (iii) in sub-clause (2) after the words "Licensing authority" the words "or as the case may be, the specified authority" shall be inserted;

(5) in clause 11, for the words "licensing authority may", the words "the licensing authority may, after receipt of the report from the specified authority", shall be substituted.

(6) in clause 12,-

- (a) after the words "by an order of" the words "the specified authority under clause 5 or of" shall be inserted;

- (b) for the words "State Government" the words "Central Government" shall be substituted.

(7) in the Schedule, in Form I,-

- (a) for the words "Licensing Authority", the words and asterisk "Licensing Authority*/Specified Authority*" shall be substituted;

- (b) the following note shall be added at the end :-

"*Note : Strike out whichever is not applicable."

*Foot Note:

The Wheat Roller Flour Mills (Licensing and Control) Order, 1957, was published under the Notification of the Government of India in the erstwhile Ministry of Food and Agriculture (Department of Food), No. S.R.O. 2861 dated the 9th September, 1957. This order has been amended from time to time by Notification Nos.:

(1) G.S.R.	348	dated	5.5.58
(2) G.S.R.	1081	dated	5.11.58
(3) G.S.R.	18	dated	2.1.60

(4) G.S.R.	751	dated	29.6.60
(5) G.S.R.	181	dated	10.2.61
(6) G.S.R.	746	dated	27.5.61
(7) G.S.R.	784	dated	7.6.61
(8) G.S.R.	1213	dated	13.9.61
(9) G.S.R.	354	dated	23.2.63
(10) G.S.R.	960	dated	6.7.65
(11) G.S.R.	1387	dated	15.9.65
(12) G.S.R.	462	dated	24.3.66
(13) G.S.R.	971	dated	18.6.66
(14) G.S.R.	2021	dated	31.12.66
(15) G.S.R.	65	dated	13.1.67
(16) G.S.R.	446	dated	21.2.69
(17) G.S.R.	1724	dated	17.5.69
(18) G.S.R.	1296	dated	27.8.76
(19) G.S.R.	874	dated	18.6.79
(20) G.S.R.	1473	dated	30.11.79
(21) G.S.R.	242(E)	dated	29.4.80
(22) G.S.R.	673	dated	10.7.81

(Gazette of India (Extraordinary) Part II; Section 3; sub-section (i);
February 6, 1982; 108-109)

HYGIENE

195 Tamarind and margosa check air pollution

Tamarind and margosa are capable of absorbing dust and gas from the atmosphere polluted by cement factories, chemical industries and quarries. These plants purify the atmospheric air. The dust is deposited on the leaves and gas is absorbed by the leaves. This does not in any way harm the plants which remain healthy. This has been established in laboratory studies carried out jointly by the Toxicological Research Centre and National Institute of Botanical Research in Lucknow during the last two to three years. About 50 plants have been identified by the Institute which check air pollution.

(Cardamom 13(2); 1981; 21)

TRANSFER OF TECHNOLOGY AND NEW INDUSTRIES

196 Technology import for distilleries

A committee set up by the government to examine the efficiency of alcohol production, improvement in technology for fermentation, fuel conservation and promotion of alcohol-based industries has recommended the import of improved technology on a national level for induction in distillery process, so that capacity utilization which is very low can be raised. There are about 127 distillery units in the country with a combined installed capacity of 7,319 lakh litres of alcohol. The committee has, therefore, recommended that a time-bound national programme should be made, taking into account all commercial aspects of successful induction of improved technology. Raw materials other than molasses, which are more expensive, should be considered for production of alcohol only if adequate quantity of molasses is not available. Among the short-term measures, sugar factories and distilleries should be compelled to provide adequate storage for molasses. They should have storage for holding at least 4 months production of molasses. There should be better temperature control of the fermentation reaction by efficient cooling by circulating the fermenting liquid through exchangers of adequate capacity.

As regards yeast recycling, the committee has recommended import under open general licences of specially designed centrifuges as they are not indigenously available. Proper facilities should be provided to propagate yeast culture without any contamination. Meanwhile, the government has decided to permit actual industrial users of alcohol to import the item directly or indirectly through their associates based on licences to be issued on a case-to-case basis. This has been done in view of the gap of 150 crore litres between availability and demand for alcohol. Though the production of alcohol has gone up from 33.5 crore litres in 1979-80 to 42 crore litres in 1980-81, the demand has risen faster from 43.5 crore litres to 57.1 crore litres.

(*Industrial News Digest* 4(11); 1981; 11-12)

PERSONALIA

RAW MATERIALS

197 New source of edible oil

Seeds of *Cleome viscosa* which grow wildly all over the barren land of the country have been found to be a source of edible oil. Its seeds resemble mustard and the plant as a whole is used as a leafy vegetable and is a good source of vitamin C and iron. The plant is known as Hurhur in Hindi or Vellaikeerai in Tamil.

The oil content of the seed is about 26 per cent which is rich in linoleic acid (70 per cent). It has no abnormal fatty acids and the crude oil is coloured for it is rich in tocopherols.

Nutritional evaluation was done by feeding the oil to rats at 10 per cent in a 20 per cent protein diet with adequate vitamins and minerals for 2 weeks. It showed good growth performance and feed efficiency ratio when compared with control group of rats fed with 10 per cent groundnut oil in a similar diet.

Toxicological evaluation by multigeneration breeding studies revealed that the animals showed good reproductive performance. There were no abnormalities found in any of the organs examined histopathologically. The liver cholesterol and triglycerides were comparable with sunflower or safflower oil fed animals. *Cleome viscosa* seed oil can be used for human consumption.

Defatted seed cake of *Cleome viscosa* was found to be a fairly good source of protein and other nutrients. The most limiting amino acid in the defatted cake was tryptophan. The seeds contained thioglucosinolates. On detoxification except for the loss of B-complex vitamins, the nutrient composition of the defatted cake remained unaltered. Rats fed with this diet showed marked improvement over the group fed with undetoxified cake.

(*National Herald* June 13, 1982, 5)

198 New use for coffee beans

An enzyme extracted from coffee beans can change type-B blood cells to type O while leaving them healthy and functional. Biochemist Jack Goldstein and his colleagues at New York Blood Centre found coffee-bean enzyme 'alpha galactosidase' removes the antigen coating from type B cells exposing material that actually changes them into type O cells.

Type O cells, the most common, are coated with sugar fructose, which is compatible with all blood types, and type 'B' cells have galactose.

Goldstein discovered that mixing coffee bean enzyme with type B blood cells remove their outer galactose coating. The fructose that is then revealed allows the B cells to pass as O type.

The tests have been carried out on human volunteers. Goldstein thinks his discovery can reduce the waste due to blood's limited shelf life since excess type B can be turned to type O on demand.

(PTI Science Service 1(15); 1982)

STORAGE AND INFESTATION CONTROL

199 Preservation of fish

Instituto de Investigaciones Tecnológicas, has developed a low cost process for preservation of fish. In this process, the split fish are buried in salt until the body fluids form a brine liquor. At 30 C, 72% relative humidity, the climatic conditions can be used for the salting/drying process. If relative humidity is high (80-90%), salting is followed by drying. The product is sealed in polyethylene film bags and has a storage life of three months at 25 C and 85% relative humidity.

(Documentation Bulletin No. 46; 1982; 22)

200 Anti-coagulants to control rats

Two anti-coagulants, namely Ratobar and Ratafin Concentrate are very effective in controlling rats. Ratobar is a ready to use rodenticide cake based on 0.025% technical fumarin, the rest being highly attractive foodstuff like maize flour, groundnut oil, paraffin, etc., in optimum proportions.

Ratafin bait is prepared by mixing thoroughly one part of Ratafin Concentrate which is a whitish powder containing 0.5% tech. fumarin with 14 parts of roasted maize flour, 2 parts of roasted groundnut flour, 1 part of crushed sugar, 1 part of roasted dry fish powder and 1 part of any cooking oil.

The rodent species such as field rats and bandicoots are readily killed by these bait poisons.

It has also been observed that in spite of the continuous use of Ratobar and Ratafin concentrate baits on a large scale over a period of nearly three years the rodents were still accepting the baits and continued to die.

(Hindu May 12, 1982; 20)

FOOD ADDITIVES

201 Lactozym and Alcalase

One of the more recent developments from Novo is the introduction of a lactose splitting enzyme, Lactozym TM. Developed primarily to treat whey, which often is considered a waste product, Lactozym has an application for almost every dairy product, particularly as a sweetening agent.

Enzymes action on proteins are another main product group within Novo's range of food enzymes. One new product, Alcalase, is particularly useful in developing valuable food products from inexpensive plant and animal proteins. The soy protein hydrolyzate makes it possible to improve the functioning properties of proteins in general, including solubility, emulsifying power, or whippability, all without reducing the nutritive value or producing bitterness. Of particular interest is a new orange protein drink developed with the hydrolyzate.

(Food Engineering International 6(4); 1981; 60)

202 Emulsifying agent - Glycerine mono stearate

Navsari Oil Products offer an emulsifying agent - glycerine mono stearate or GMS - for the foodstuff industry. GMS comes in two grades; SE-IQ (self-emulsifying type), and NSE (nonself-emulsifying). Apart from foodstuffs, the product finds applications in the preparation of creams, lotions, lipsticks, etc.

(Protein Foods and Nutrition Development Association of India Newsletter No. 18; 1982; 2)

PROCESSES

203 Soy oil extraction with carbon dioxide

Scientists at the Department of Agriculture's Northern Regional Research Centre, Peoria III, have extracted oils from soybeans and other seeds using super critical carbon dioxide, instead of hexane.

Carbon dioxide at high pressure and above its critical temperature of 31 C, has a density of a liquid but diffuses as a gas. Supercritical carbon dioxide at 5000 psi and 50 C, when passed through crushed and flaked soybeans, absorbed 1.2 to 1.4% of its weight in oil - about the same yield as

with conventional hot hexane extraction. Raising the pressure to 8000 psi increased the yield to 2.7% by weight. The oil can be separated from the gas either by reducing the pressure or by increasing the temperature, the latter approach would be more energy efficient in a large-scale process.

The main difference between oils extracted with carbon dioxide and with hexane is that the carbon dioxide-extracted oil contains less than 10% as much phosphorus 'gum'. It is essentially equivalent to a degummed hexane crude and does not require an extra degumming step after extraction. It is also lighter in colour than degummed hexane crude.

Supercritical extraction now is used commercially to remove caffeine from coffee. The long-range cost and availability advantages makes it possible to use it for soybeans. The cost of hexane has increased ten fold in less than ten years. At the current rate of loss of 0.7 gal per ton, oilseed processors use 21 million gal of hexane to extract oil from a billion bushels of soybeans every year.

(*Chemical Engineering News* 59(21); 1981; 34)

204 Separating the rice germ

Scientists of the Paddy Processing Research Centre (PPRC), Tiruvarur, have recently developed a method of separating the rice germ (embryo) from brown rice before polishing. This method, it is stated, can be applied on a large scale.

Apart from the non-edible nature of this contamination the keeping quality of the rice germ is also very much affected.

A simple equipment has been designed and fabricated. The clean brown rice is fed into this unit and kept in a state of suspended motion so as to avoid any abrasion or other mechanical damage to the grain. Friction caused between the grain results in some polishing and separation of the germ.

The walls of the chamber are perforated so that as soon as the germ gets detached, it is blown out by air through the perforations.

Some degree of polishing also occurs at the same time, with the result that what emerges is a mixture of germ and fine bran in approximately equal proportions from which the germ can be separated by sieving and winnowing.

It is now possible to recover more than 95 per cent of the available germ in a highly purified form. The parboiled rice germ can also be fully removed by the degermer but the yield is only half of that from raw rice. Modern rice mills with a milling capacity of 100 tonnes can easily produce about 1.5 to 2.0 tonnes of germ a day.

Work on the fabrication of a continuous de-germer which can form part of modern rice mills and stabilisation of the rice germ by easily adoptable methods are now under study.

(*Hindu* January 6, 1982; 26)

05 Conversion of starch to glucose by immobilized enzyme

A novel process has been developed by the Departments of Bio chemistry and Chemical Engineering at the Indian Institute of Science, Bangalore, in which starch is degraded to glucose using immobilized glucoamylase. Enzyme immobilization is a process in which the enzyme is anchored to an inert solid support or entrapped in the pores of a gel without altering its enzymic properties. An enzyme in its immobilized form can be easily recovered and reused. In the present process, the raw starch is initially treated with alpha-amylase to convert it to water soluble dextrans. The solution of dextrans is then passed over a bed of immobilized glucoamylase particles at about 60 C to obtain glucose. The glucoamylase used in this process is thermostable and exhibits optimum activity at 60 C in the pH range 5.0-6.0.

Salient features of this new process include isolation of highly thermostable glucoamylase from a thermophillic fungus, immobilization of the enzyme on inert solid supports without essentially altering its enzymic properties and its kinetic characteristics. The thermostable enzyme allows reactor operation at higher temperature than what is normally employed and it is for the first time that such an enzyme has been used in its immobilized form for starch conversion to glucose.

(*Sendoc Bulletin* 9(9); 1981; 1)

206 Oil from tamarind kernel

Tamarind kernel contains nearly 6 to 8 per cent oil recoverable by solvent. The process involves roasting and decorticating of tamarind kernels in a roller-beater. These were moistened and disintegrated in a hammer mill. The resulting particles were flaked, cooked in a kettle cooker and passed through an expeller to give a cake like material. The kernel cake is extracted with normal hexane solvent, leaving the oil.

It is suitable for use in paints and varnishes. The de-oiled tamarind kernel powder could be used for industrial starch extraction in cotton and jute industries.

(*Hindu* June 24, 1982; 9)

207 Saving energy in vanaspati production

Energy conservation to the extent of 16.2 crore kilowatt hours (KWH) a year is possible by modifying blends of certain imported edible oils used in the manufacture of vanaspati.

The study, by Dr. M.S.A. Kheiri, of the Malaysian Palm Oil Research Institute, related to three imported oils: soyabean, rapeseed and palm. A laboratory model blend consisting of 56 per cent palm oil, 24 per cent hydrogenated palmolein and 20 per cent indigenous oil, according to the findings showed that the power consumed to process one tonne of vanaspati was only 54 KWH. Against this, about 341 KWH was required for the current formulation consisting of 10 per cent hydrogenated palm oil, 70 per cent hydrogenated soyabean or rapeseed oil, and 20 per cent indigenous oil.

Another interesting point brought by the study related to nutritional aspects. Indian vanaspati, according to this study, has more than 50 per cent trans acid content. In the West, for health reasons, efforts are being made to keep the percentage of trans acid content to as low as two per cent in fat based foods.

The samples analysed for this study covered manufacturers who produced 82.7 per cent of India's vanaspati (1980) production.

(PTI Science Service 1(12); 1982)

208 Fuel-saving solution concentrator

A new type of energy-saving solution concentrator is based on a specially developed PBIL (Polybenz Imidazolone) reverse osmosis membrane for concentrating dilute solutions. Compared to conventional cellulose acetate membranes, it requires a very small amount of energy for thin water solutions like fruit and vegetable juices to be concentrated simply by applying pressure to remove the bulk of water content. It thus saves the fuel consumed in conventional process in which the dilute solutions are heated for concentration. The new concentrator features a wide acidity range of 1-12 pH and offers high resistance to both organic and inorganic substances.

(Invention Intelligence 16(12); 1981; 550)

BYPRODUCTS AND WASTE UTILIZATION

Nil

PROCESSED PRODUCTS

209 Tandoori quail

The famous tandoori-chicken has now a rival - the tandoori quail. A pre-cooked ready-to-eat tandoori quail is being developed by scientists of the Central Avian Research Institute (CARI), Izatnagar.

While tandoori quail can become a commercial proposition, Dr. B. Panda, Director of CARI, said the institute has already developed quail egg pickle. As the quail eggs are small weighing only about 10 grams, conversion of these into pickles will be preferable to using them directly. The pickle can be a good source of animal protein as many people may prefer pickle to the eggs. (PTI Science Service 1(12); 1982)

EQUIPMENT AND MACHINERY

210 New offal grinders

Mincing and grinding fish offal for use in pet foods, or other uses where its high protein content is of value.

Bristol-based firm is marketing several grinding and mincing machines and specifically developed for the fish processing industry. These machines have a specially designed screw with shaped cupped flights to enable them to handle whole fish.

The mincers are available in sizes from six to 16 inches.

(*Fishing News International* 21(3); 1982; 73)

211 'BAHUBALI' drum mixer

'Bahubali' Drum Mixer is operated by a single person for various processes and operations of Mixing, Homogenizing, Dispersing, Deburring, Blending, etc.

'Bahubali' Drum Mixer is specially designed for mixing Chemicals, Powders, Dye-stuffs, Granules, Colours, Pigments, etc. 'Bahubali' Drum Mixer is ideally recommended for homogenizing fine chemicals and solid/viscous materials for thorough dispersion. The turbulent mixing design is ideally suitable for mixing relatively small batches of powder and solid materials. Some of the special applications are Deburring, Tumbling and Polishing of

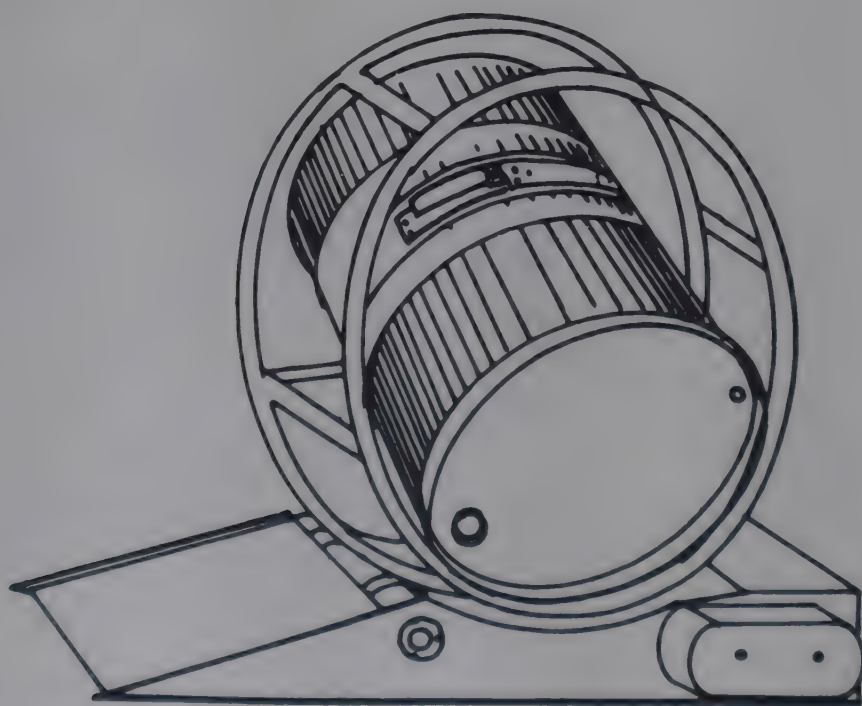
components and spares, cleaning, scrapping, oiling De-rusting the inside surface of the drums and containers.

'Bahubali' Drum Mixer is also useful for movement, separation and dilution of viscous liquid fluid materials packed in a sealed barrel or container to prevent structural changes and solidification.

'Bahubali' Drum Mixer is fabricated out of sturdy steel structure. The ergonomical aspect enables compact and aesthetically designed structure. This equipment is available with 3 phase - 1 H.P. electrical drive which enables desired speed in range from 5 to 35 R.P.M. It also contains standard electrical accessories like on-off push button starter, limit switch, cable, etc.

'Bahubali' Drum Mixer is primarily used in Agro & Food, Chemical, Plastics, Petrochemical, Paint, Engineering, Dye-stuff and other processing industries. The present range of 'Bahubali' Drum Mixer comprises of 5 models with respective capacities ranging from 5 litres - laboratory model, 20 litres, 50 litres, 100 litres and 200 litres standard barrel model.

For detailed technical literature and informations on 'Bahubali' Drum Handling Equipment and your other problems on drum handling, Please contact: Fibro Industrial Trading Company, Kurla-Andheri Road, Sakinaka, Bombay - 400 072. Tel: 67 14 82



212 Cutting, slicing, mixing/grinding machine for vegetables

As a pioneer in small scale engineering design, the company has marketed an apparatus costing Rs. 2,500 for mixing, grinding, cutting and slicing of different kinds of vegetables, tuber crops, meat and corns. It can also be used for processing arecanut, arrow root, etc. With a 0.5 hp motor, the

unit can handle potatoes, bananas, tapioca, etc. at 200 kg/hour; coconut grating at 10 Nos./min; green chillies, onion, carrot, beans, etc. at 10 kg/min; wheat for upma at 1 kg/12 min; and meat for cutlet 10 kg/12 min. They have also designed a smokeless oven for firewood for homes and catering establishments.

(*Polytechnology No. 8; 1982; 8*)

213 Mince-meat production machine

Manurhin - Manufacture de Machines du Haut-Rhin- of France produce the Gelfra mince-meat production equipment from a patent held by Anvar-Agence Nationale de Valorisation de la Recherche. The process consists of cutting up beef, mixing and forming it into hamburger steaks in a continuous process without any manual handling, using completely automatic and compact equipment which is housed in an isothermic negative-atmosphere container. The product can thus be gradually refrigerated throughout the manufacturing process. The production unit reportedly guarantees a high standard of bacteriological purity, better taste, and a reduction of weight loss.

(*Protein Foods and Nutrition Development Association of India Newsletter No. 5; 1982; 1-2*)

214 Mango stone decorticator

According to a recent report, mango kernel oil has been tested by the Nutrition Research Laboratory, Hyderabad, as of edible grade. If this industry has to grow, devices are necessary to process the kernels. M/s Jyoti Ltd., Vadodara have marketed a decorticator. The mango stones dry/wet are fed into the hopper of the machine from where they move into the decorticating chamber. The decorticating beater opens out the pericarp from the ventral edge and the kernels are separated from the pericarp. The kernels pass out through the concave into the kernel gathering chute. The pericarps of the decorticated mango stones are taken out on one side and ejected out through the automatic opening and closing window outlet. The outlet is so designed that if sufficient amount of pericarps gather in the chamber, it opens out automatically and after ejection of the pericarp, close automatically.

Specifications:

Mango stone moisture content at the

time of decortication

: from 3 to 75%

Output

: 300-500 kg/hr. of mango stone

Power required	: 2.2 kw (3 H.P.) electric motor
Labour required	: 2-3 labourers
Overall dimensions L x W x H	: 1060 mm x 950 mm x 1320 mm
Weight	: 140 kg

(Polytechnology No. 8; 1982; 6)

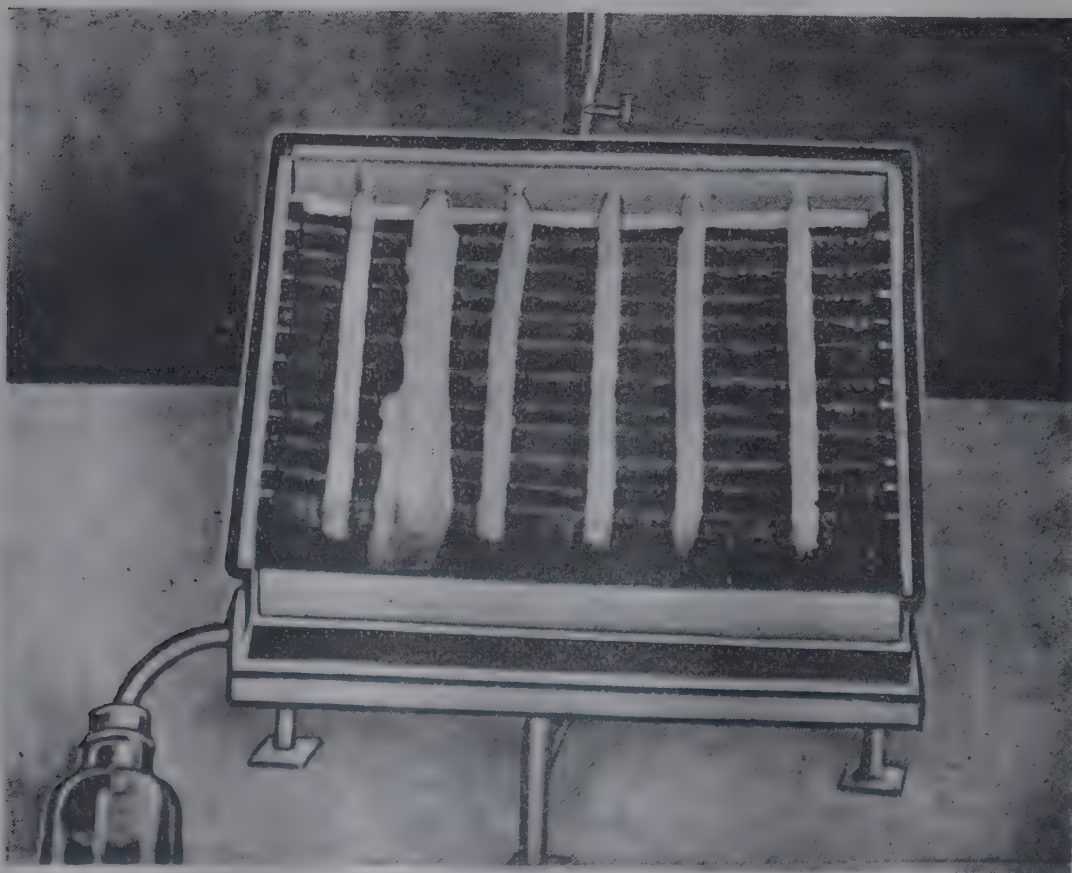
215 Industrial water treatment plant

The range of Srinivas Industrial water treatment plants covers: continuous counter-current ion exchangers, reverse flow filters, counter-current fixed bed exchangers, accelerated clarifiers, condensate polishers, and dual media filters.

(Industrial Products Finder 9(11); 1981; 118)

216 Potable water from solar still

Potable water is obtained in the still by desalination of brackish raw water using solar energy. A simple and inexpensive solar still has been developed for this purpose in the Department of Mechanical Engineering of the



Indian Institute of Science, Bangalore, under a project funded by the CSIC. The still is particularly suitable for use by rural households and communities.

The main materials used in the fabrication of the still are wood, glass, G.I. sheets and gunny cloth. Expected output of the unit is 3 litres/sq. meter on bright days and around half this quantity on cloudy days under Bangalore weather conditions.

The solar still can be used in places which are away from good drinking water sources but where saline water is available nearby and in places where water has high percentage of undesirable salts like fluorides.

It can also be used as a source of distilled water for batteries with some modifications in the materials used.

(CSIC Newsletter 3(4); 1981; 1)

217 Air filter

Delbag-Luftfilter GmbH, Fed. Rep. of Germany, offer a variety of air filters for removing coarse dust, fine dust, superfine dust, aerosols, paint mists, fatty fumes, odorous fumes, as well as bacteriological, radio-active and similar substances. Fabric filters, adsorption filters and electrostatic filters are available in various grades and mountings to suit specific installation requirements. The filters are used in chemical processes, grain mills, food processing, insecticide manufacture, hotels, halls, hospitals and other industries.

(Industrial Products Finder 9(11); 1981; 82)

218 Fabdecon mixtruder

Fabdecon mixtruder claimed to be designed for mixing and extruding almost every type of material that could be encountered in the food, plastics, rubber, drug and chemical industries. The machine is a sigma type mixer with a screw in the bottom for unloading, or extruding the mixed material. During the mixing process, the extrusion screw is driven in a reverse motion by a separate motor. This action of the screw pushes the material into the mixing zone and within reach of the blades, thus assuring a thorough blending of all the ingredients, and at the same time, reducing the mixing time as compared with a standard sigma type mixer.

For discharging the material, the direction of the screw's rotation is reversed and mixed material is then unloaded through the extrusion barrel. The present capacities range from 25 to 2000 litres and can be supplied in various material of construction viz. carbon steel, stainless steel of all grades alloy steels, hastelloy, abrasion resistant TISCRA, etc.

(The Economic Times June 21; 1982; 7)

219 Palm oil extractor

A press designed to improve the efficiency of the traditional techniques of oil extraction, has been reported from University of Science and Technology, Kumasi, Ghana. This method involves boiling the fruit, the boiling time depending on the heat content of the firewood; but the fruit must be boiled sufficiently so that there is no difficulty in removing the fibres from the kernels. The boiled fruit is pounded in a mortar while hot, and the product is then put in the press for extraction. The pressing is done once only, as it has been found that a second pressing in the same press is uneconomical. The extraction is done by two men.

The design is an adaptation of existing presses used in Nigeria and Sierra Leone and is capable of pressing 20 kg of pounded boiled fruit at one time, with a maximum pressure of 40 kgf/cm^2 . Average extraction rate of the press is 14.56 per cent, with 12 minutes required for each pressing. Eight hundred kilograms of fruit can be processed during an eight-hour period, which means that if there is a constant supply of fruit, approximately 116 kg (28 gallons) of oil could be produced each day.

(*Polytechnology* No. 8; 1982; 7)

220 Paddy parboiling unit

The Central Rice Research Institute, Cuttack, has developed a low-cost mini paddy parboiling unit, with a capacity of 75 kg, which can profitably be used by small and marginal farmers.

The parboiling unit is made of 20-gauge mild steel sheet. The unit consists of two chambers, separated by a perforated partition. The lower portion holds water and the upper portion holds paddy. A central galvanised iron pipe with perforated laterals has been provided for better distribution of steam. An outlet has been provided for discharging the parboiled paddy. A rubber gasket on the cover of the outlet makes it completely water tight. The paddy is parboiled by soaking it at about 75 C for 3 hours followed by steaming at atmospheric pressure for 30 minutes.

The parboiled paddy obtained from this unit is free from odour or dark colour. Parboiling is very uniform with little white bellies. The total recovery is 75 per cent with 1-2 per cent broken grains.

The cost of the unit is Rs. 300 and operational cost is only Rs. 7 per quintal.

(*PTI Science Service* 1(18); 1982)

21 Paddy husk combustor

Paddy husk so long regarded as a waste, causing storage and disposal problem also, can now be commercially used for drying paddy in rice mills. The Central Mechanical Engineering Research Institute, Durgapur, and the Central Fuel Research Institute, Dhanbad, have jointly developed a paddy husk combustor-cum-heat exchanger for the purpose, at the instance of the Food Corporation of India and the Union Ministry of Food and Agriculture. The first plant installed at FCI's rice mill at Durgapur has successfully completed its trial runs recently and has been handed over to the FCI for regular operations. The plant has the capacity of drying about 1.2 tonnes of parboiled paddy by burning approximately 100 kg of husk per hour.

The installation consists of a vertical cylindrical combustor with a heat exchanger mounted over it. Husk is fed by screw conveyor and injected into the combustor with the help of conveying air from a blower and a distributor. Husk is burnt in suspension with primary air from a second blower, which is passed through a hollow main shaft and a stirrer casting at the bottom of the combustor. This is rotated very slowly, and a scraper attached to the stirrer removes the ash through holes at the bottom. The ash falls in a conical hopper and is removed through a porthole. A third blower supplying secondary air, suppresses flame from touching the heat exchanger tubes. The fourth and the main blower draws in hot air from the heat exchanger and delivers it to the dryer through ducts.

The furnace temperature is 600-800 C, with an average husk feed rate of 15 kgs (one bag) in 8 to 9 minutes. Six to eight thousand cubic feet of hot air is delivered per minute at a temperature of 100-130 C, ensuring drying of 4.8 tonnes of parboiled paddy (moisture content 13 to 14%) in just over 4 hours. The unit ensures 100 per cent burning of the husk inside the combustor. The ash can be used as fertilizer, and for production of cement and other potential applications.

The technique also completely eliminates the chance of sulphur contamination of rice, which normally occurs with furnace oil fired drying. (Information from: Central Mechanical Engineering Research Institute, Mahatma Gandhi Avenue, Durgapur 713 209).

222 Centrifugal starch separator

A centrifugal tapioca starch separator which is claimed to increase the percentage of starch recovery and at the same time eliminate unhygienic manual operations and cut down cost of production, has been developed at the Mechanical Engineering Department of the Government Engineering College, Salem.

Centrifugal separation (with a battery of hydroclone and basket type centrifuges), enables full recovery of starch as the tapioca tubers can be crushed and starch extracted simultaneously.

Other advantages claimed for the centrifugal separator are: the area required for setting up a sago and starch unit is reduced by 40 per cent; it eliminates the traditional settling tank and cuts down on expenditure; starch recovery being complete, there is no secondary starch which reduces profit; prevents fermentation which degrades starch materials; since the effluent from the centrifuge contains not more than 0.2 per cent of starch, the same water can be recycled three to four times; and by using sulphur-dioxide treated water in the process, onset of fermentation and growth of fungus can be arrested.

The prototype of the separator is practically ready but for some final touches and the department is looking for outside help to bring it to the production stage.

(*Hindu* May 12; 1982; 17)

223 Medium-size tunnel

Recognized internationally as a leading manufacturer of industrial refrigeration equipment, Brodrene gram has added a new automatic freezing tunnel, the GFC-medium, to its range of freezing plants. Available in six standard sizes, the unit has a relatively small product weight loss, due to highly efficient air circulation. The space requirements are small compared to high capacities capable with the freezing tunnel.

Gram has also diversified rather widely into packaging equipment, featuring at the interpack exhibition a multi-lane heat seal wrapper for the wrapping of chocolate bars, marzipan loaves, biscuits, etc. The machine is designed for capacities upto 60,000 bars/hour.

(*Food Engineering International* 6(4); 1981; 58)

24 Continuous butter cooling

A considerable reduction in the chilling storage capacity required by dairies can be achieved through use of a cooling system developed by Ole Gerstenberg ApS, the latest addition to the firm's range of butter handling equipment.

Gerstenberg's new surface scrapped heat exchanger can cool up to 2,500 kg of freshly churned butter to a temperature below 6 C hourly in a continuous process. In addition, it can be used for the production of the recombined butter, fat compounds, and freezing mixes.

(Food Engineering International 6(4); 1981; 58)

25 Microwave ovens

Microwave ovens have several advantages like rapid heating, economic utilization of energy in heating bulk materials, uniform heating, and better control. It has got special usefulness in food industry where pasteurization, concentration, blanching, or inactivation of enzymes, moisture equalization in bulk materials, thawing, precooking, puffing and baking, drying especially for instant soup powders, tea, coffee, etc. For further information please contact: Microwave Products (Pvt) Ltd., Puthenchira, 680 682, Trichur Dist., Kerala, India.

226 Hot air oven

D'Sco hot air oven, manufactured by Medica Instrument Mfg. Co., Bombay, can be supplied with an optional triple chamber, with holes on all sides and the top, to ensure uniform temperature throughout the chamber. It is finished



in heat resisting aluminium paint inside and grey hammertone outside. There is double walled construction with heavy fibreglass insulation. Temperature range is from ambient plus 5 to 200 C (or 250 C). The working chamber is available in various sizes from 40 cm x 30 cm x 30 cm to 60 cm x 60 cm x 90 cm. The equipment works on 230 V, 50 Hz supply.

(Industrial Products Finder 9(11); 1981; 60)

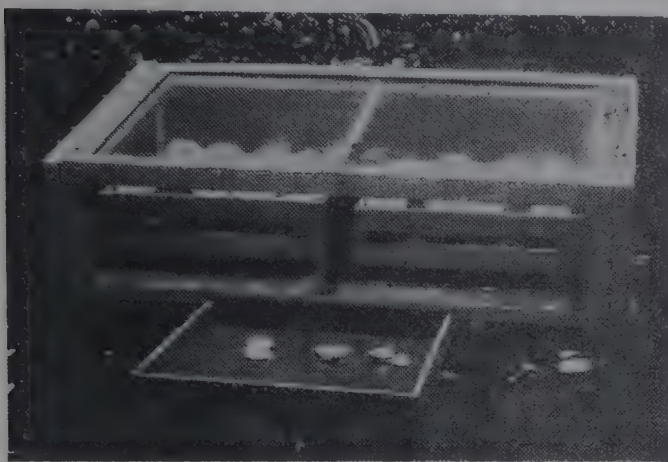
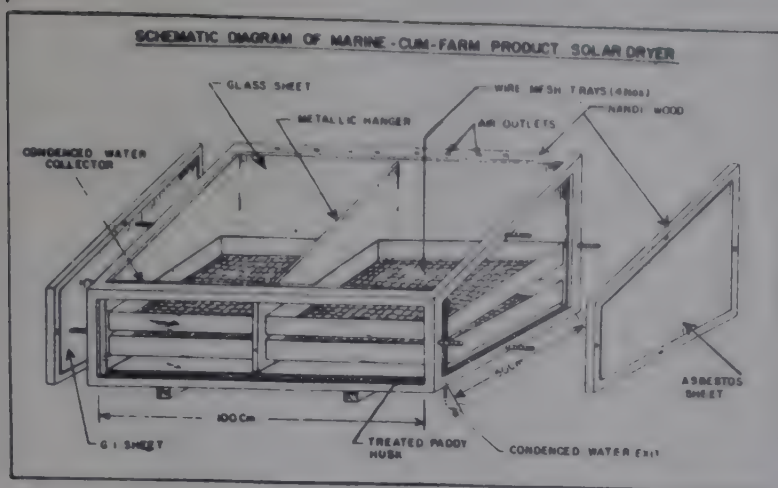
227 Home made solar cooker

Mr. Bhim Sen Bhola of New Delhi, has developed a solar cooker which costs only about Rs. 120/- and can cook porridge, pulses, gram, rice, khir, potatoes, carrots, etc., in 2-3 hours in summer and 3-4 hours in winter, depending on the intensity of solar radiation. The cooker consists of a wooden box with inside dimensions 63.5 cm x 63.5 cm x 17.8 cm and a tray-like aluminium box of dimensions 43 cm x 43 cm x 12.7 cm. The inside of the aluminium tray is painted black. Foods to be cooked are placed in aluminium utensils of 20 cm diameter and 7.5 cm height painted black on all sides including the bottom and the lid, which are then put inside the box and placed in the sun. A stand front angle iron fixed with two perambulator wheels at the front end, facilitate easy movement of the box. Mr. Bhola proposes to fix up a 1 cm diameter aluminium pipe all round the inside of this cooker with two ends projecting outside from the wooden box, and to connect water supply to one end and to take continuous hot water from the other end for washing clothes, cleaning utensils or taking bath in the winter. The box will also be fixed in such a way that it can be tilted to face sun rays perpendicularly to absorb solar heat. The cooking utensils will then have to be suspended in such a way that the contents do not spill out and the utensils always remain in horizontal position. The cooker besides saving the cost of fuel, helps to retain the natural flavour, minerals, vitamins of the food cooked. For further information, please contact Mr. Bhola, Rtd. Dy. Director (DGS&D), at J-9/2, Rajouri Gardens, New Delhi 110 027.

228 Agricultural waste used boilers

Industrial Boilers Pvt. Ltd. have got boilers which can utilize agricultural wastes like bagasse, rice straw, husk, etc. for steam generation. The steam thus generated could be used either for the process of heating or for power generation. Utilization of agriculture wastes in this way not only results in considerable saving of money but also reduces pollution of environment and problems associated with pollution. For further information and advise contact: Industrial Boilers Pvt. Ltd., 701-C, Poonam Chambers, Dr. Annie Besant Road, Worli, Bombay 400 018.

229 Marine-cum-farm product solar dryer



Experimental set-up for drying coconuts: (a) in the marine-cum-farm product solar dryer, and (b) in the open sun.

The model is a rectangular box, having a surface area of 100 x 50 cm, with an inclined upper lid. It weighs about 50 kg and occupies about 0.5m² floor space. Its two special features are: (i) a nylon thread wick to collect and discharge condensed water; and (ii) a detachable metallic hanger fitted in the middle of the cabinet to increase the efficiency of the dryer. The hanger is made of GI sheet casing filled with metallic shavings, generally obtainable as a waste product from lathe operators.

The provision of the hanger is important in that it increases the moisture loss by about 10%. In the preparation of copra from coconuts, it was found essential to keep the han-

ger fitted in the cabinet throughout the period of drying: it not only quickened the process of drying but also helped to obtain white copra of first grade quality.

About 50 large size coconuts cut into halves could be dried in one lot in about 48 hours. The temperature of the *in situ* air in the laden state (coconuts) was noted to be about 70 C while that of the ambient air was 34 C in May (1980). A comparative study conducted simultaneously showed that open sun drying of the coconuts took about 9 days.

The drying period for red chillies and grapes was noted to be about 72 hours and the metallic hanger was found to be necessary only in the initial phase of drying.

The dryer was also tried for curing dressed and brined pieces of ribbon fish (*Trichiurus lepturus*): it took about 48 hours to dry 25 kg of the fresh fish dressed and cut to 6 x 6 x 1.0 cm pieces.

(Invention Intelligence 16(10); 1981; 459-460)

230 Multipurpose solar drier

India's first multi-purpose solar drier developed at Alathur in the rice-rich Palghat district of Kerala with a capacity to dry thirty tonnes of paddy a day, is claimed to be the largest in the country. The drier, conceived and developed indigenously by the NIDC consists of two layers of quality glass on the top of a built-in structure and a layer of black-coated corrugated aluminium sheet below. The heat transmitted by the glass will be reflected through the corrugated aluminium sheet and the hot air from this would be passed on by a huge blower through a pipe to the rotating bucket underneath. The grain gets dried up to the desired extent in the hot air blown into the rotating bucket.

The solar drier system is an improvement to those in operation in other countries, as it is capable of recycling the unused energy. The Alathur drier is provided with the necessary elevator and other controls to obtain optimum drying of all types of agricultural produce including copra, tapioca, pepper and other cash crops.

The cost of processing one tonne of paddy is only Rs. 6. The investment is Rs. 8.5 lakhs.

(Polytechnology No. 11; 1982; 9)

231 Three-stage dryer

Although DEC's Filtermat dryer has been in existence for more than ten years, it now introduces a further improvement of this unit, the Filtermat 3-stage dryer.

In the first stage, the concentrate undergoes a pressurized atomization through nozzles placed in the top of a primary drying chamber. When the wet droplets are exposed to the hot drying air, the surface water will evaporate almost instantly. This first stage process is very short about 7-8 seconds

In the second phase, the powder, which has now been reduced to about 10-20 per cent moisture, is now deposited on the moving Filtermat belt. This belt, woven of polyester filament allows the drying air to pass through while the powder is retained on the belt.

After this second drying stage, the powder now has a moisture content of around 12 per cent and next enters a retention section which allows the powder for some products to stabilize and obtain a thorough, porous structure while the moisture content is still high enough.

From this retention stage the powder is conveyed to their third and

final drying stage where drying is completed with a low temperature drying air. Then the powder is cooled to a desired temperature and any fat crystallized. The powder leaves the dryer by simply falling off the belt as an agglomerate. Afterwards it will pass to sifting system for fractioning into the desired particle size and structure.

(*Food Engineering International* 6(4); 1981; 62)

232 Improved energy efficiency drying system

Improved energy efficiency is offered by the latest Niro Atomizer two-stage drying systems, which are made up of spray dryers followed by fluid beds. This combination produces a milk powder of higher bulk density and with a lower occluded air content.

(*Food Engineering International* 6(4); 1981; 60)

233 Tube expander for dairy

Recticans Rotoburs Industries manufacture a tube expander for dairy applications. In a dairy piping, 90° bends do not permit free movement of the tarer mandrel beyond a certain point, as the elbow wall obstructs the movement. The mandrel length should, therefore, be short but, at the same time, the required expansion should be achieved. The mandrel should not be pulled out of the expander assembly while removing the expander after expansion. The Recticans expander reportedly meets these requirements in that it features a mandrel with minimum projection and a stopper. The thrust collar, with thrust-bearing construction, eliminates the chances of the tube ends rubbing while expanding. A maintenance kit consisting of different sizes of tube expanders and corresponding clamping sleeves, cutting rings, spacer rings, etc. can also be supplied.

(*Protein Foods and Nutrition Development Association of India Newsletter* No. 18; 1982; 2)

234 Pepper grading machine

MERADO, Cochin has developed a machine for grading pepper as per Agmark specification. This is a simple rotary sieve type of machine. It can be operated manually or using power and is suitable for field or factory use. A machine with rotary sieve of size 150 mm dia x 1200 mm length can grade 500 kg of pepper in an eight hour shift. MERADO, Cochin can undertake to design larger machines upto a capacity of 15 tons as per customer's requirements.

(*Polytechnology* No. 8; 1982; 4)

235 Arecanut grader

An arecanut grader has been developed at Tamil Nadu Agricultural University, Coimbatore. The grader can be used for grading dried arecanut fruits as well as nuts.

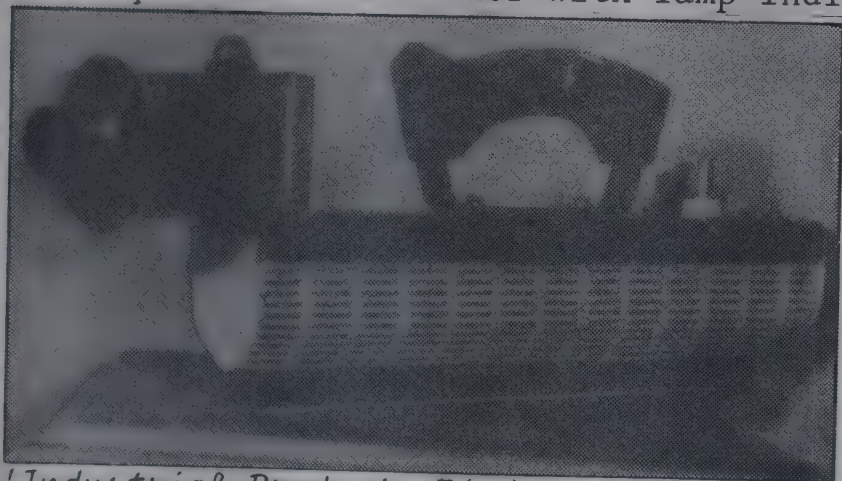
It consists of a feed hopper, 5 pairs of revolving rollers and outlets for different graded materials. The rollers are made of 18 mm G.I. pipes and coupled with hand rotor by means of a rope. The revolving rollers are given manually. The machine can grade 75 kg dried arecanut fruits and 100 kg nuts per hour. The grader costs Rs. 1500/- only.

(Polytechnology No. 8; 1982; 4)

PACKAGING

236 Plastic sealer

Asian Long Life sealer is a gadget for plastic sealing. It has a built-in temperature controller with lamp indication, and replaceable heating element.



The body with wooden operating handle and chrome plated sealing edge have been specially designed for working convenience. The sealer is also available without a control box.

(Industrial Products Finder 9(7); 1981; 88)

237 Cup filler features contamination controls

Cup filler BK 6006/6 UV-C offers a double-six-lane filler fitted with high capacity lamps for decontaminating packaging materials. This unit fills/closes various dessert products in four filling stations, free of recontamination. The first two stations can fill either two different products side-by-side or a single product. The third is used for whipped cream; the fourth for caramel or fruit concentrate. Output is 24,000 cups/hour, filled and closed. The cups are then conveyed to an automatic packer, and previously formed clusters are packed into trays.

(Food Engineering International 6(4); 1981; 81)

38 Ampoule filling device for liquid fumigants

A unit for mass-filling ampoules with identical volumes of liquid fumigants like Ethylene-di-Bromide, Ethyl formate, Acrylonitrile and their formulations in a 'closed-system' for easy adoption has been designed and developed. These filled ampoules which are sealed, rolled and packed in pouches serving as evaporating media, could be used as 'minifume' for regulated/controlled release of 'spot fumigant'. This is ideally suited for disinfection of foodgrains at household and farm levels.

While filling of liquid fumigants in ampoules by syringe or burette is both hazardous and a time consuming job, large scale filling with high speed automatic machines are too costly and too unwieldy for a small scale industry and further there seems to be every chance of the poisonous vapour build-up near the hosting area of the machine beyond permissible level.

These draw-backs are overcome in the newly designed ampoule filling unit. It will be profitable with a manufacturing rate of even 1000 ampoules a day. (*Indian Food Packer* 35(4); 1981; 32-35)

239 Foodstuff container

Cidelcem have developed the Bank unit, a transparent container used to protect perishable foodstuff along the supply line. The unit is made of polycarbonate, which has an exceptionally long life span, and is shock-proof and resistant to temperatures between -90 C and +100 C. The unit can be transferred directly from the freezing room to a microwave oven.

(*Protein Foods and Nutrition Development Association of India Newsletter* No. 18; 1982; 2)

240 Water bottle

Jodhpur Zinc Metal Works offer a range of water bottles from 0.5 to 10 litres capacity. The bottle is made of zinc sheet and covered with woollen felt. It is fitted with an ice chamber.

(*Industrial Products Finder* 10(4); 1982; 53)

241 Food cans for homes, institutions

Innovative flat-profile, rectangular food cans with "Easy-O" lids (no can openers needed) are offered in institutional and consumers sizes. The "Menu Tray" size fits 1/3 steam-table size, three containers per opening. The "Easy Serve" consumer size features quality lithography. Unique

two-pieces aluminium construction means no side or bottom seams. These cans may allow packaging of foods not previously available as shelf-stable items. The Menu tray greatly reduces cooking/sterilization time for certain foods. The 50-mm deep tray may be stored at least one year without cooling; it allows packaging of foods not offered in No.10 round cans - such as lasagna, stuffed pork chops and Mexican specialities. The Easy Serve size has the same advantages, and it may be matched with a plastic lid for simple reclosing.

(Food Engineering International 6(4); 1981; 65)

242 Plastic crates

National Crates manufacture plastic crates (i. dim., 490 x 330 x 300 mm³) which are light weight, tough, dent-proof and easy to clean and withstand temperatures from -40 C to 125 C. These could be used in light engineering, food processing, chemical and pharmaceutical industries.

(Protein Foods and Nutrition Development Association of India Newsletter No. 18; 1982; 1)

243 Oxygen decontamination

Automatic, semi-automatic and manual vacuumizing/gassing installations are offered to end oxygen contamination. Quality loss is thus minimized in storage of such products as milk powder, liquid eggs, baby foods and the like. In the system, vacuum is drawn to 99.5%, then the vacuum is broken by such inert gases as nitrogen, carbon dioxide or a mixture of them. Storage in such a safe, neutral atmosphere is claimed to a range of perhaps three years. A mixing gas installation is also available.

(Food Engineering International 6(4); 1981; 93)

ANALYSIS

44 Automatic Kjeldahl system

The first fully automatic Kjeldahl system for determining protein/nitrogen content, the Buchi 322/342 is designed for laboratories that perform a low to average number of determinations - up to 80 analyses per day. The full automation is achieved by upgrading the basic combination of 322 Distillation Unit and 342 Control Unit with an on-line End Point Titrator and a Programmable Calculator. Buchi Laboratory-Techniques, Switzerland. (*Protein Foods and Nutrition Development Association of India Newsletter No. 14; 1982; 2*)

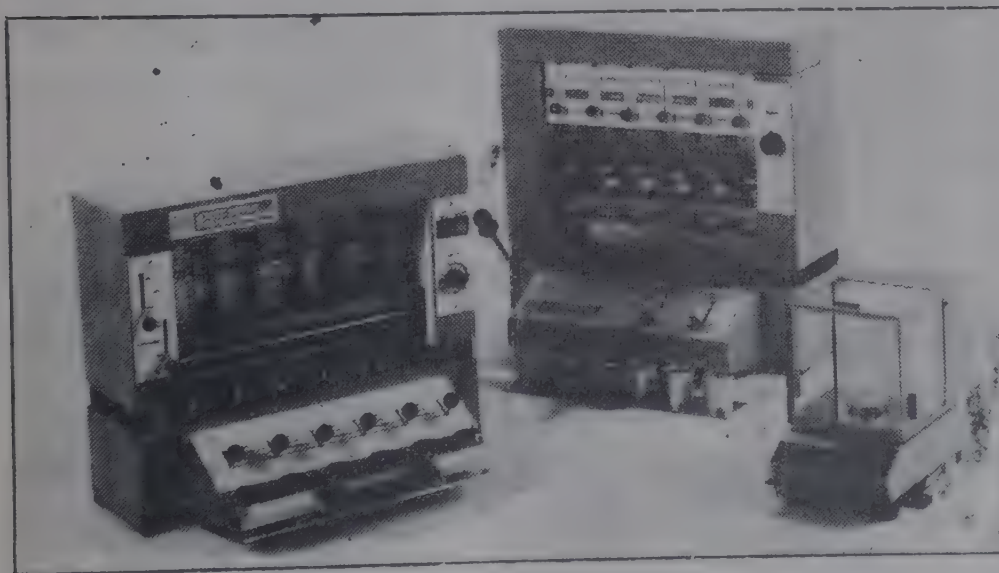
45 New automatic Kjeldahl range

The third generation Kjelttec Auto 1030 Analyzer is built around a microprocessor that automatically controls dispensing of reagents, titration, calculation and presentation of the result. Total analysis time is about 2 minutes. Tecator, Sweden.

(*Protein Foods and Nutrition Development Association of India Newsletter No. 14; 1982; 2*)

46 Hydrolyzing unit for fat analysis

A new type of hydrolyzing unit, called "Soxtec system H⁺1", offers



a timesaving, safe and accurate way of fat determination according to demands - SBR, EEC, AOAC, etc. It would be used in combination with a standard extraction unit. It is useful in the field of foods for materials requiring an acid pretreatment.

(*Invention Intelligence 16(7); 1981; 332*)

247 Indicating temperature controller

Bico Series IC-50 electron indicating temperature controller is for accurate control and indication of industrial processes. It is rugged, relatively maintenance-free, and not affected by vibrations. Integrated circuit technology is used to achieve high reliability and accuracy of 1% FSD. Sensor input may either be a thermocouple or a platinum resistance bulb. The range extends from -200 C to +1,600 C. Automatic cold junction compensation and thermocouple fail safe device are built in. The control mode can be of single or double set point, and control sensitivity is adjustable to a maximum of 0.25% FSD. On/off operations are indicated by lamps on the front panel. Supply requirement is 230/115 V AC, 50 Hz. Panel cut-out requirement is as per DIN-43700:186 mm x 186 mm. Applications are in electric furnaces/ovens, plastic extruders, blow and injection moulding machines environmental chambers, heat exchangers, drying plants, as well as chemical textile, paper, steel, petroleum, fertiliser, and rayon industries.
(*Industrial Products Finder* 9(11); 1981; 25)

248 Contactless temperature measuring

When the temperature of moving objects or objects with poor thermal conductivity has to be measured, the Ultrakust (Fed. Rep. of Germany) contactless measuring process is used; for example for plastic foils, conveyor belts made of rubber or textiles, paper, wood, glass lacquered parts, foodstuffs such as bread or vegetables, chemicals or plants. The temperature range may reach 600 C or go below zero. A multitude of radiation probes are available for any use. A standard built-in filter, which only permits radiation in a range of 8 to 14 microns to filter through, eliminates the influence of stray radiation (sunlight, infrared radiators) or intermediate medias (water vapour). Thermophil Infra Type 5680 is a digital-indicating radiation thermometer with a three-digit, brightly illuminated fluorescent display. The emission factor of the surface to be measured is continuously adjustable in a range of 0.1 to 1.0. The instrument possesses two adjustable and via the digital display controlled switch-points, rendering possible signalling and controlling, and an analogous output of 0 to 10 V for the connection of recorders and a BCD output. The radiation probes are connected via a 5-pole screw-in socket on the front plate. The probe's response time is 500 ms.

(*Industrial Products Finder* 9(7); 1981; 47)

249 Automatic density control in fluids

Valmet Instrument Works at Tampere, Finland, make instruments for the continuous measurement of density of fluids flowing through a system. The Dens-el and Dens-air transmitters convert the density measured into an electric or pneumatic signal of 0-20 mA or 0.2-1.0 bar and 3-15 psi, respectively. The heart of the transmitter in each case is a balance which measures the changing mass of fluid in a glass or stainless steel U-tube.

The transmitters can detect changes of down to under 0.1%. They can measure liquids with densities between 0.5 and 3.0 kg/dm³, at flow rates up to 120L/minute (metal tube model) and 80L/minute (glass tube model). Measuring spans can be chosen from 0.025 kg/dm³ to 0.5 kg/dm³. Over the smallest and greatest spans the transmitters have a repeatability of 0.25% and 0.05% with non-linearities $\pm 0.5\%$ and $\pm 0.2\%$, respectively. Maximum working pressure is 10 bar and maximum fluid temperature 110 C.

The transmitters can be used for measuring the density of liquids such as fructose solution, sugar syrup, molasses, cream, separated milk, alcohol, starch solution and beer.

(Food Technology in New Zealand 16(1); 1981; 69)

250 Colour analysis system

Photomarker Corporation, USA, have developed PM 600, an automated colorimeter, to provide reliable and flexible colour measurements with speed and simplicity. The instrument's design incorporates a dual-track fibre optics transmission that enables the sensor probe to transmit reflected colour measurements to a scanning colour sensor system. Users include industries such as food, chemical, plastics, paper, textiles, dyes and pigment, paints, etc.

(Industrial Products Finder 10(Annual number); 1981; 171)

251 Infra-red spectrophotometer

Perkin Elmer's new ratio-recording infrared spectrophotometer Series 680 offers exceptional accuracy and sensitivity especially with those samples that have high background absorbance. It employs two microprocessors, one for scan control and the other for ratioing and ordinate processing. There is no calibration error even with fast scan of less than 2 minutes. High ordinate accuracy of plus/minus 0.2% T and reproducibility of plus/minus 0.05% T make quantitative analysis more meaningful. Noise level is

minimised by digital smoothing. Keyboard selection of instrument settings such as baseline, ordinate expansion and scan limits make operator error minimal.

(Industrial Products Finder 9(7); 1981; 18)

252 Spectrophotometer

ECIL's spectrophotometer GS866D is a compact instrument for colorimetric and spectral analysis. The instrument has provision for double cell accommodation, extended path-length and pre-mounting of both phototubes. A fully solid-state design, built-in stabilised power supply, and feed-back stabilized amplifier with FET ensure drift-free operation and accuracy. The grating monochromator with a grating of 600 lines/mm gives a pure, normal spectrum. The tungsten lamp with a very stable supply provides a constant illumination throughout the spectrum. The radiation detectors are phototubes, one for the Blue region (340-600 nm) and another for the Red region (600-950 nm), pre-mounted in the detector compartment. The instrument finds applications in chemical laboratories of industries such as chemical; drugs and pharmaceuticals; dyes, paints and detergents; fats and oils; pesticides; and fertilisers; petroleum and oil refineries; and cement, sugar and foodstuff manufacture.

(Protein Foods Nutrition Development Association of India Newsletter No. 12; 1982; 1)

253 Environmental chamber

IEC's precision environmental chambers, Models A, B and C, are provided with heating to +60 C, cooling to -40 C (or still lower), humidification, de-humidification, illumination, programmer for any or all the parameters and a chart recorder. Typical uses are: incubation or bacteriological cultures, germination studies of seeds, plant growth, animal and insect rearing, storage of antibiotics, BOD tests, preservation of vaccines and extracts, storage and ageing of samples, chromatography and conductivity tests.

(Protein Foods and Nutrition Development Association of India Newsletter No. 14; 1982; 1)

254 Device to detect pollutants

Two environmental biologists at the Sri Venkateswara University have developed portable, sensitive and cheap biodetector strips for spot analysis and rapid detection of hazardous pollutants like heavy metals, pesticides and fungicides in water. Based on the thin-layer chromatographic-enzymatic technique developed by them, the biodetector strips could be easily operated in field condition as no electricity was required.

The biodetector strip which has been tested for more than two years in the field and laboratory is claimed to be the first of its kind developed anywhere. The technique, which utilises the citric acid cycle in the acetone homogenate, could be employed for quantitative and qualitative determination directly in fresh and sea water. The spectra system requires the cleaning up of the salt component in water for detection and analysis of pollutants. The technique was to put the pollutants on the strips, spray acetone base over it and warm the strip by a cigarette lighter for two minutes. The catalyst and the substrate laid on another strip was sandwiched with the first strip and warmed for 10 to 15 minutes. The heavy metals appeared as a clear white spot amidst pink background.

(*Industrial Toxicology Bulletin* 6(1-3); 1982; 7)

255 New series 90 ultrafiltration unit gives 33% energy saving

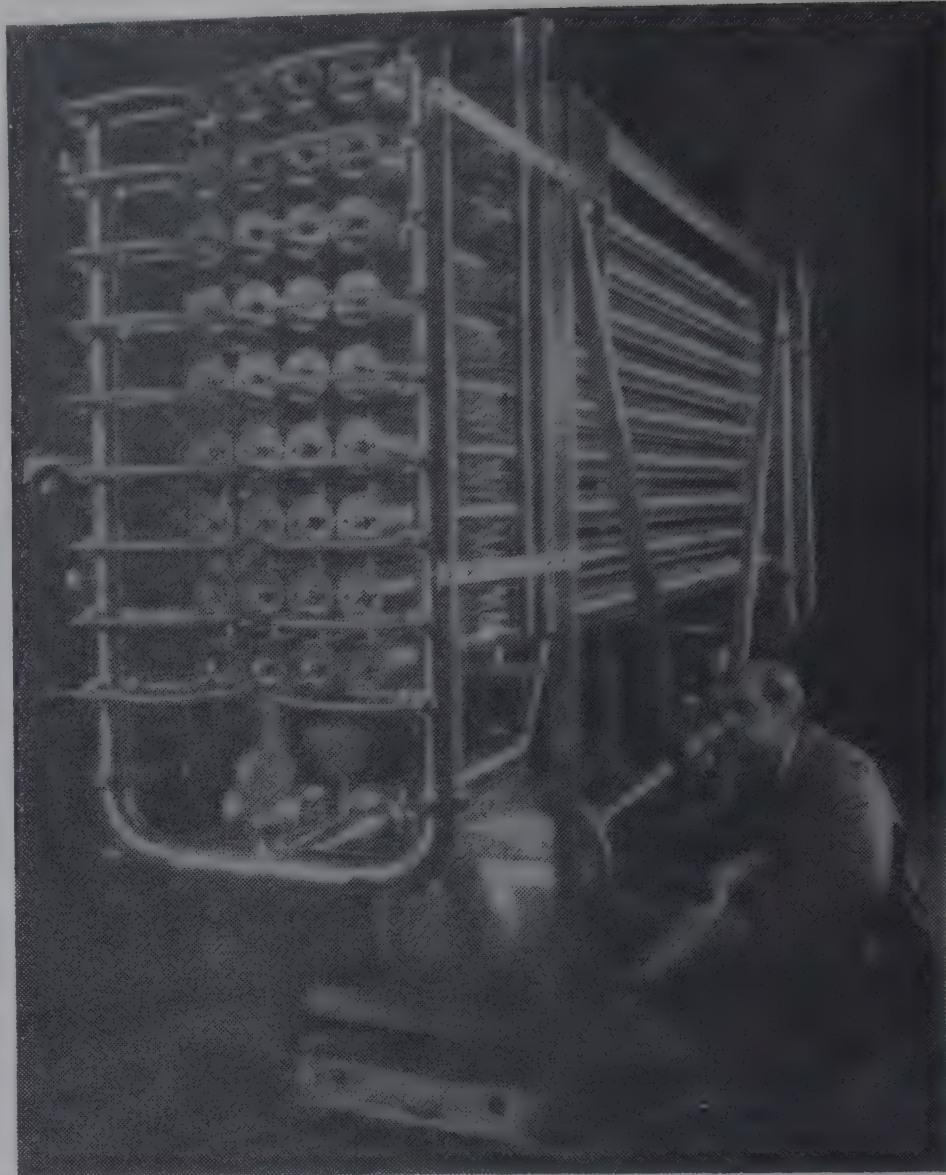
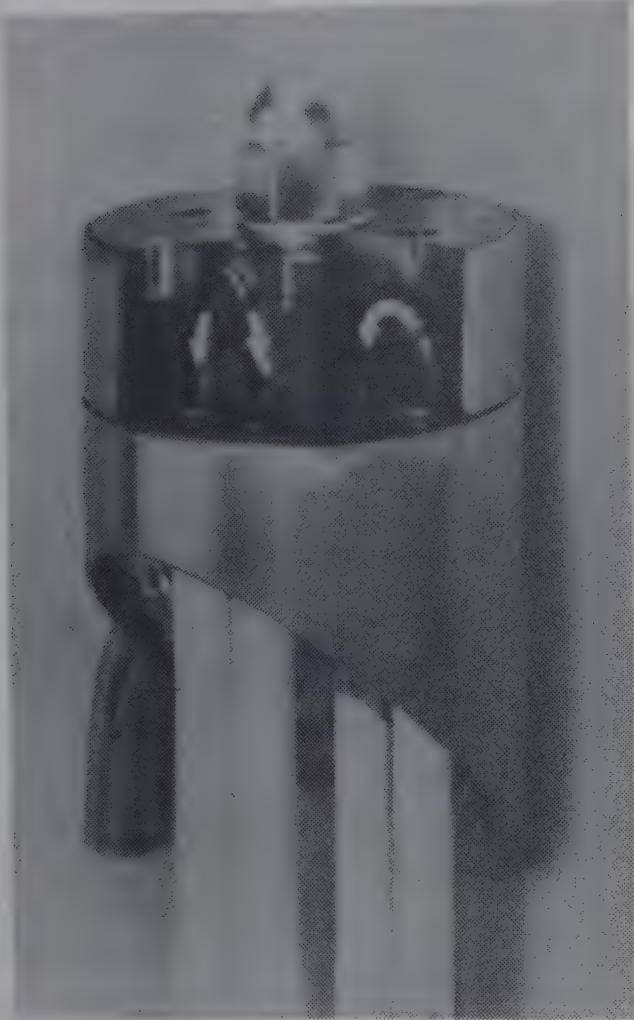
P.C.I. Ultrafiltration is used for concentration and fractionation of whey and skim milk, the concentration and purification of enzymes, the recovery of valuable by-products from wood pulping effluents, etc.

P.C.I. have now produced a new design incorporating a twin port end cap which provides a higher energy efficiency. The extra energy saving is achieved by having a configuration of fewer tubes in parallel and more in series within each module. This reduces the energy consumption by 33%.

The plant is normally fitted with 35 stainless steel modules of Type B1 design, 3.66 m long. The circulation pump is a Fristam single stage centrifugal type. The other module within the stack acts as a heat exchanger to ensure the temperature of the process liquor is maintained at the required level.

The plant is also fitted with an automatic cooling water control valve and a recirculation temperature control to automatically maintain the recirculation temperature. Electric actuators are fitted to the pump and module outlet throttle valves in order that the valves may be easily adjusted.

ted during normal operation. Pressure indicators are fitted to the pump inlet, pump outlet and module inlet.



The unit is normally operated as one state of a continuous multi-stage system. It may also be used as a single stage concentrator.

For further information contact : Paterson Candy International Ltd.,
Reverse Osmosis Division, Laverstoke Mill, Whitchurch, Hampshire RG 28 7NR.

COMMERCIAL INTELLIGENCE

PRODUCTION (RAW MATERIALS)

256 All India final estimate of onion, 1980-81

State	Area (thousand hectares)	Production (thousand tonnes)
Andhra Pradesh	16.5	114.7
Bihar	15.1	100.3
Gujarat	11.6	249.2
Haryana	1.9	37.8
Himachal Pradesh	0.6	1.1
Jammu & Kashmir	0.4	0.6
Karnataka	35.5	227.3
Kerala	0.4	2.7
Madhya Pradesh	13.0	134.6
Maharashtra	52.3	684.3
Orissa	43.1	291.2
Punjab	1.2	16.8
Rajasthan	9.6	28.4
Tamil Nadu	19.7	196.4
Tripura	0.1	0.2
Uttar Pradesh	19.6	324.9
Delhi	*	0.1
Pondicherry	*	0.3
All India	240.6@	2410.9@

* - less than 50 hectares

@ - excludes 3464 hectares of area and 5585 tonnes of production for Assam State since similar data for 1979-80 is not available.

(Directorate of Economics & Statistics, Ministry of Agriculture, Government of India, New Delhi)

257 Minor oilseeds statistics

Minor oilseeds	(Qty : tonnes)					
	Collection of seeds		Production of oil		Production of De-oiled cake	
	1978-79	1979-80	1978-79	1979-80	1978-79	1979-80
Sal	19000	175000	2500	25000	17000	150000
Mahua	50000	60000	40000	23000	34000	35000
Neem	30000	NA	30000	NA	NA	NA
Karanj	NA	NA	8000	NA	NA	NA
Kusum	NA	NA	7000	NA	NA	NA
Mango kernel	27000	10000	1600	850	24000	3000
Others	NA	NA	4900	NA	NA	NA
Total	192300*	330000*	94000*	60000*	120000*	250000*
	126000+	245000+		46850+	75000+	193000+

Note : NA - Not available

* - Provisional estimates

+ - Excluding neem, karanj, kusum and other minor oilseeds

(Economic Times May 12; 1982; page III)

258 Estimated potential of minor oilseeds

	(Qty: lakh tonnes)		
	Seed	Oil	Oilcake
Sal	60.00	7.20	52.80
Mahua	10.00	3.50	6.50
Neem	16.00	3.20	12.80
Karanj	4.00	1.10	2.90
Kusum	2.00	0.66	1.34
Mango kernel	20.00	1.20	18.80
Total (including others)	150.20	20.00	130.00

(Economic Times May 12; 1982; page III)

(Marine Fisheries Information Service No. 32; 1981; 2)

Sl. No.	Name of fish	West Bengal	Orissa	Andhra Pradesh	Tamil Nadu	Pondicherry	Kerala	Karnataka	Goa	Maharashtra	Gujarat	Andaman	Lakshadweep	Private Trawlers	Total
1.	Elasmobranchs	114	3,772	4,842	15,442	435	6,803	2,910	894	7,752	14,558	56	284	—	57,862
2.	Eels	—	—	289	85	8	6	131	6	3,154	8,403	—	—	—	12,082
3.	Catfishes	723	2,198	2,338	4,047	78	13,936	5,354	1,151	8,653	5,235	32	—	—	43,745
4.	Chirocentrus	276	1,460	1,123	2,695	98	1,002	171	124	2,039	3,792	25	—	—	12,805
5.	Oil sardine	—	—	—	320	—	69,667	42,727	2,367	663	—	—	—	—	1,15,744
a)	Lesser sardines	—	1,891	13,930	29,940	2,736	11,017	4,135	1,798	1,363	—	243	—	—	67,053
b)	Hilsa ilisha	644	5,091	96	37	25	14	8	8	1,017	56	—	—	—	6,996
c)	Other Hilsa	20	46	1,267	3,084	53	21	25	14	607	3,965	25	—	—	9,127
d)	Anchoviella	—	270	6,182	13,126	287	7,772	5,621	249	78	—	99	—	—	33,684
e)	Thrissoles	194	333	7,326	5,048	387	2,241	850	779	1,271	913	—	—	—	19,342
f)	Other clupeids	674	2,576	5,486	1,833	273	574	1,088	302	16,897	8,538	29	—	—	38,270
g)	Harpodon nehereus	419	378	611	6	—	—	15	12	57,393	36,671	—	—	—	95,505
a)	Saurida & Saurus	—	189	931	1,123	160	7,080	508	199	1,057	85	—	—	—	11,332
b)	Hemirhamphus & Belone	—	46	97	749	26	361	180	6	42	6	41	99	—	1,653
7.	Flying fish	—	17	43	1,106	3	—	55	2	—	—	—	29	—	1,255
8.	Perches	13	341	4,639	6,886	666	17,814	1,069	269	3,712	2,454	302	376	—	38,541
9.	Red mullets	—	296	349	1,079	150	8	38	15	461	667	—	27	—	2,416
10.	Polynemids	186	1,126	1,448	629	6	—	—	10	1,976	—	—	—	—	6,056
11.	Sciaenids	358	2,864	9,496	19,547	320	6,164	3,500	1,530	13,956	31,625	—	—	—	89,360
12.	Ribbon fish	142	928	15,646	7,862	179	12,937	1,499	1,089	11,550	10,858	—	—	—	62,690
13.	Caranx	—	607	5,981	5,405	479	4,399	4,507	884	1,315	461	147	80	—	24,265
a)	Chorinemus	130	567	710	1,111	2	145	67	71	357	1,022	—	—	—	4,182
b)	Trachynotus	—	—	—	38	2	—	—	—	—	—	—	—	—	40
c)	Other carangids	—	97	188	188	—	59	232	—	369	—	—	—	—	945
d)	Coryphaena	—	3	141	141	—	138	—	—	20	—	—	—	—	302
e)	Elacate	—	19	148	148	—	19	3	190	—	—	—	—	—	379
f)	Leiognathus	34	704	3,775	38,153	681	4,147	4,671	1,727	406	—	102	—	—	54,400
a)	Gazza	—	3	56	84	—	1	42	—	—	—	—	—	—	186
b)	Lactarius	—	65	940	938	29	861	998	614	450	2,520	—	—	—	7,415
16.	Pomfrets	921	9,072	2,201	1,306	188	907	696	257	10,081	12,587	15	—	—	38,231
17.	Mackerel	—	265	6,203	7,229	445	18,474	19,634	2,446	288	112	183	—	—	55,279
18.	Seer fish	234	1,542	2,970	7,179	85	3,763	1,941	735	3,219	4,180	117	21	—	25,986
19.	Tunnies	—	34	419	4,233	—	10,611	952	356	1,674	277	55	1,760	—	20,371
20.	Sphyraena	—	8	88	932	55	330	84	171	33	—	67	14	—	1,782
21.	Mugil	—	1	27	577	49	151	39	11	24	1,034	117	—	—	2,030
22.	Bregmaceros	—	—	—	—	—	—	—	—	159	757	—	—	—	916
23.	Soles	3	69	573	2,094	151	4,394	782	1,311	1,797	2,459	—	—	—	13,633
24.	Penaeid prawns	152	1,074	5,660	9,082	485	52,633	3,098	1,853	23,433	14,481	54	—	32	1,12,037
25.	Non-penaeid prawns	48	30	4,346	946	42	1,742	128	—	47,309	4,109	—	—	—	58,700
a)	Lobsters	—	—	10	90	4	18	110	18	225	204	—	—	—	679
b)	Other crustaceans	20	359	1,413	6,174	172	7,286	2,765	1,933	297	4,967	—	—	—	25,386
c)	Cephalopods	4	98	470	1,472	40	4,244	122	210	1,191	3,471	—	13	—	11,335
d)	Miscellaneous	788	1,055	3,913	15,230	591	7,803	4,567	879	5,475	23,027	94	206	2,212	65,840
26.															
27.															
TOTAL		6,097	39,375	1,16,013	2,17,394	9,390	2,79,543	1,15,322	24,490	2,31,763	2,03,494	1,803	2,909	2,244	12,49,837

*Partial coverage of larger trawlers

260 Production of hops in Kashmir Valley

Year	Number of growers	Area (ha)	Production (tonnes)	Value (Rs. in lakhs)
1980	525	150.0	85.0	59.5
1981	600	300.0	170.	119.0

(RRL Jammu Newsletter, special supplement 9(3); 1982; 14)

PRODUCTION (INDUSTRIAL)

261 Sugar production

According to the Indian Sugar Mills Association, the sugar production during the second fortnight of July 1982 (i.e. 16.7.82 to 31.7.82) was about 36,000 tonnes as against 12,000 tonnes during the same fortnight last year. The total production in the month of July 1982 and Tenth month of the season 1981-82 was about 89,000 tonnes as against 20,000 tonnes during the same month last season. This brings the total output during the first ten months of the season 1981-82 to 83,64,000 tonnes as against 50,64,000 tonnes during the corresponding period last year.

(Indian Sugar Mills Association - August 19; 1982)

262 World production of pyrethrum

Kenya, Tanzania and Rwanda produced 90 per cent of world pyrethrum output in 1980, with a total production of 16,000 tonnes of dried flowers. Ecuador and New Guinea accounted for 10 per cent output. Kenya's production of pyrethrum rose to 10,400 tonnes in 1980, accounting for 66 per cent of total pyrethrum production. Pyrethrum is used in insecticides, and synergised pyrethrum is being developed for use as a food additive.

(Industrial Toxicology Bulletin 6(1-3); 1982; 9)

EXPORT

263 Exports of barley from India

Country	1979-80		1980-81	
	Qty.	Value	Qty.	Value
Bahrain	500	639	-	-
Nepal	158	317	-	-
Kuwait	21600	27040	4640	7593
Qatar	2036	3594	-	-
Saudi Arabia	17421	38131	-	-
United Arab Emirates	300	398	-	-
Others	1500	2480	-	-
Total	43516	62509	4640	7593

(*Profoodcil Bulletin* 16(1/2); 1981; 56)

264 Export of mango oil/fat and mango kernel extraction

	Year	Quantity (tonnes)	Value FOB (Rs. lakhs)	Unit Value (Rs. per tonne)
Mango oil/fat	1979-80	106	18.00	16,981
	1980-81	637	110.86	17,403
Mango kernel extraction	1979-80	2828	17.00	601
	1980-81	5192	34.39	662

(*Economic Times* May 12, 1982; Page III)

265 Exports of papads from India

Year	Qty: M. Tonnes Value: Rs. '000	
	Quantity	Value
1977-78	1588.6	11379
1978-79	1811.2	14280
1979-80	2505.4	22188

(*Indian Export Trade Journal* 36(2/3); 1982; 19)

IMPORT

266 Imports of 8 major oils and fats (1000 MT) by India

Imports	Oct. -	Jan. -
	Dec. 1980	Sept. 1981
Soyabean oil (a)	108	522
Cotton Oil (a)	-	24
Groundnut oil (a)	-	-
Rapeseed oil (a)	41	55
Coconut oil	2	56
Palm oil (a)	95	345
Butter as fat (a)	1	12
Tallow & grease (a)	7	39
	253	1053

(a) Exports of known supplying countries considering one month shipping time
(*Oils & Oilseeds Journal* 34(2/3); 1981; 55)

TRADE INFORMATION

267 Trade Enquiries for spices

1. Mr. H. Kurosawa
Asst. Manager
Niishin Oil Co.
1-23, Shinkawa, Chuo-Ku
TOKYO.
Tel : 03-555-6869
Cardamom oil
Cardamom
2. Mr. Mitsuki Akama
Sales Manager
Nippon Restaurant Supply Inc.
Kyoci Bldg., 2-22-7, Shibuya,
TOKYO 150
Tel : 03-407-6623
03-409-5744
Cardamom
3. Mr. Okayasu
Restaurant Roi
1-31-20, Yakigaya,
Funabashi-Shi,
Chiba, JAPAN.
Tel : 0474-49-0549
Cardamom
4. Mr. S. Inaba,
Shoei Foods Co
5-7, Akihabara,
Taito-Ku, TOKYO.
Cardamom
5. Mr. Choudhry Mohammad Akhtar
Al Khaja Trading Agency & Co.
P.O. Box 2567,
Sharjah, UAE
Spices all kinds. Garlic, onion,
food stuff, Agricultural material
and livestock goats.

contd.

contd.

- | | |
|--|--|
| 6. Mr. Abdulahi Khogali
P.O. Box 6772
Telex: 46024
Dukarem, Dubai, UAE. | Cardamom |
| 7. Mr. Safook Al Keddah,
Al Keddah Trading Co.
P.O. Box 10136
Deira, Dubai, UAE | Fennel, Fenugreek, Coriander
and Cumin. |
| 8. Mr. Abdulla Mohammed
Mohammed Safer
Gulf Flower
P.O.NBox 41,
Shop No.21,22,
Makah, Sharjah, UAE.
Telex: 68283 | Cardamom, Coffee |
| 9. Mr. Abubaker
Al-Siddique Commercia Org.
P.O.Box 5330, DUBAI | Cardamom. Requested for actual
super and lowest C&FC price in
US dollars. |
| 10. Dr. A.M. Kjeni,
P.O. Box 3057
Ruuri-Muscat,
Sultanate of Oman | Cardamom |
| 11. J.R. Hadani
New Empire Trade Corpn.
P.O. Box. 7650
DUBAI | Cardamom - C&F price Dubai, Damam
& Jeddah. Coconut powder, coffee
powder. |
| 12. Fujoirat Corpn.
Ssothing
P.O.Box 178,
Fujoirat, UAE
Phone: 22253
Telex: FUJAIRAH | All kinds of Hail (Cardamom) and
Gahwa. |
| 13. Andrew, A.A.
Aluares,
P.O.Box 980
SHARJAH | Cardamom and Spices |
| 14. Mohammed Khanis Al Fazari
Ghantut Trading Co
P.O. Box 8539
Abu Dhabi, UAE
Phone : 338144, 21191 | Cardamom and Spices |

(Cardamom 14(6); 1982; 29)

268 Trade enquiries for processed foods

<u>Name of the Importer</u>	<u>Items of interest</u>
Setraco, 64, Granville Road, LONDON N12 OHJ	Canned Vegetables, Fruits and Fruit Juices, Jams and Marmalades
Ethiopian Retail Trade Corporation, P.O.Box No.3332, ADDIS ABABA	Canned Food Items
K.J. Renner, Apt L 1 Talla Villa Apts, 925 E Magnolia Dr. Tallahassee, FLORIDA 32301	Canned Tropical Foods, Jam Pickles and Chutney, Frozen Fruits and Vegetables
Mahboob Trading Co. Ltd., P.O.Box 3738 Safat - KUWAIT	All kinds of Processed Food Items
H.O.H. Purchasing & Management Services Ltd., P.O.Box 22142 Safat KUWAIT	All kinds of Processed Food Items
Johannes Brauwers, Kaiser-Wilhelm-Ring 19, 4000 DUESSELDORF	Alcoholic Beverages
Lal's Trading Co. Ltd., P.O. Box 11096, Deira, DUBAI	Canned Meat, Fresh and Frozen Meat, Fresh Fruits and Vegetables
Percival Mills, Spring Cottage, Dale Lodge Road, Ascot, BERKSHIRE.	Select Honey
Distriquim S.R.L., Moreno 442, Piso 14C, P.O.Box 1091 BUENOS AIRES	Dessicated Coconut

(Profodcil Bulletin 16(1/2); 1981; 60)

269 Importers of food products

Richard J. Hall Produce Ltd., 2nd floor, 90 Calverly Road, Tunbridge Well Kent TN11 2UN LONDON	Importers of mango chutney and mango products.
Northern Food International Cheapside Chambers 43, Cheapside, Bradford LONDON	Importers of fish products

contd.

contd.

Nortrade Marketing A/S,
P.O. Box No. 9094,
Vaterland
OSIO 1 NORWAY

Importers of food and kindred products, canned and preserved fruits and vegetables, grain mill confectionery products, food preparations.

Mr. Tula OON-OB
C/o T. Nithaya Phanich,
1293/54, Saraphee soi 3,
Khonesan,
BANGKOK 6

Importers of cashew nuts processing machine.

M/s Perere & Sons (Bakers) Ltd.,
217, Galle Road,
Kollupitiya,
SRI LANKA.

Importers of appliances for food and bakery industry.

Universal Merchandises Ltd.,
Executive House,
Coombe Road,
LONDON

Importers of rice cereals, spices, pulses in bulk and packaged form canned vegetables and fruits.

(*Indian Export Trade Journal* 35(9/10); 1981)

FOOD REGULATION, QUALITY CONTROL AND HYGIENE

REGULATION

270 Packing size of edible oil containers

Under the Standards of Weights and Measures (Packaged Commodities) Rules, packing of edible oil, vanaspati, etc., can be done only in certain specified units including 5, 10, 15 and 20 kg. from 1st April 1980. However packed sizes of 4 & 16.5 kg. will also be permitted upto 31st March, 1983. (*Oils & Oilseeds J.* 34(2/3); 1981; 51)

271 Coffee export duty raised

The Government raised the rate of export duty on coffee from Rs. 120 a quintal to Rs. 190 a quintal from July 5th 1982. (*Hindu* July 7, 1982; 13)

QUALITY CONTROL

272 Prevention of Food Adulteration (iii Amendment) Rules 1982

G.S.R. 245(E) - Whereas certain draft rules further to amend the Prevention of Food Adulteration Rules, 1955, were published as required by subsection (1) of section 23 of the Prevention of Food Adulteration Act, 1954

(37 of 1954), with the notification of Government of India in the Ministry of Health and Family Welfare (Department of Health) No. G.S.R. 142, dated the 30th January, 1981 published in the Gazette of India, Part II Section 3 Sub-section (i) dated the 7th February, 1981 (at pages 273 to 275) inviting objections and suggestions from all the persons likely to be affected thereby by the expiry of ninety days from the date on which copies of the Gazette of India in which the said notification was published, were made available to the public.

And whereas the copies of the said Gazette were made available to the public on the 7th February, 1981 and whereas the objections and suggestions received from the public on the draft rules have been considered by the Central Government;

Now, therefore, in exercise of the powers conferred by sub-section (1) of section 23 of the said Act; the Central Government after consultation with Central Committee for Food Standards hereby makes the following rules, further to amend the Prevention of Food Adulteration Rules, 1955, namely:-

RULES

1. (1) These rules may be called the Prevention of Food Adulteration (iii) Amendment) Rules, 1982.

(2) They shall come into force on the date of their publication in the Official Gazette.

2. In the Prevention of Food Adulteration Rules, 1955, in Appendix 'B':-

A. in item A.12

(a) after clause 3, the following shall be inserted, namely:-

"4-Melting point of extracted fat -31 C to 37 C (Capillary Slip Method).

5-Unsaponifiable matter of
extracted fat.

Not more than 1.5 per cent by
weight

6-Free fatty acids (as oleic
acid) of extracted fat OR
Acid value

Not more than 0.25 per cent by
weight

Not more than 0.5";

(b) for the figure and words "2 red units", the figures and words "2.5 red units" shall be substituted;

B. in item A.17.09

(a) for the words "SAFFLOWER OIL", the words SAFFLOWER SEED OIL" shall be substituted.

(b) in clause (c), for figures '146', the figures '148' shall be substituted;

C. after item A.17.22, the following shall be added, namely :

"A.17.23 - Rice Bran Oil means the oil obtained from the layer around the endosperm of rice obtained from paddy of *Oryza Sativa* Linn. Fam Gramineae, which is removed during the process of rice milling and is generally known as rice bran.

Refined Rice Bran Oil shall be obtained from solvent extracted oil, neutralised with alkali, bleached with bleaching earth or activated carbon or both and deodorised with steam. Alternatively deacidification, bleaching and deodorisation may be done by physical means.

The oil shall be clear and free from rancidity, adulterants, sediments, suspended and other foreign matters, separated water and added colouring and flavouring substances. The clarity of the oil shall be judged by the absence of turbidity after keeping the filtered sample at 35 C for 24 hrs. Rice Bran Oil shall be sold for human consumption only after refining. It shall conform to the following standards, namely:

(i) Moisture and insoluble impurities	Not more than 0.1 per cent by weight
(ii) Refractive index at 40 C	1.4600 to 1.4700
OR	
Butyro-refractometer reading at 40 C	51.0 to 66.4
(iii) Saponification value	180 to 195
(vi) Iodine value (Wijs' method)	90 to 105
(v) Free Fatty acids (as oleic acid) per cent by weight	Not more than 0.25
OR	
Acid value	Not more than 0.5
(vi) Unsaponifiable matter, per cent by weight	Not more than 3.5
(vii) Flash point (Pansky Marten closed method).	Not less than 250 C.

Note: The edible oils prescribed under item A.17 shall be free from Castor oil.

D. in item A.19

- (a) after the words, "allowed by the Government for the purpose:", the following words shall be added, namely:- "Refined sal seed fat, if used, shall not be more than 10 percent of the total oil mix";
- (b) in clause (vii), for the figures "1.25", the figures "2.0" shall be substituted:

E. in item A. 19.01, after clause (b) the following clause shall be added, namely :-

"(c) it may contain added mono-glycerides and diglycerides as emulsifying agents".

(Gazette of India (Extraordinary) Part II, Section 3, sub-section (i), March 11, 1982; 304-304/1)

3 Amendment to vegetable oil products control order

G.S.R. 247(E) - In exercise of the powers conferred by sub-clause (1) of clause (4) and sub-clause (1) of clause 4B of the Vegetable Oil Products Control Order, 1947, the Vegetable Oil Products Controller for India hereby makes the following Order further to amend the Order of the Government of India in the Ministry of Civil Supplies No.GSR. 717(E), dated the 26th December, 1980, namely :-

In the said Order, in the Table after the existing proviso to Item 1, in column (1), the following further proviso shall be added at the end, namely:-

"Provided further that when imported vegetable oils are used in vanaspati for supply to the Army Purchase Organisation of the Government, the percentage of such vegetable oils shall not exceed 95% (ninety five per cent)".

2. This order shall come into force immediately.

(Gazette of India (Extraordinary) Part II, section 3, sub-section (i); March 12, 1982; 308)

HYGIENE

4 Caffeine hazards

The United States Food and Drug Administration has advised doctors to warn patients who are or may become pregnant to avoid or limit consumption of foods and drugs containing caffeine. There is no direct evidence that caffeine causes birth defects in human beings. However, it is known to cross

the placenta, and it has been shown to have teratogenic potential in several animal studies. Beverages containing caffeine include coffee, tea, cola, chocolate and it is also an ingredient in various over-the-counter and prescription medicines.

(*Industrial Toxicology Bulletin* 6(1-3); 1982; 10)

75 Safe detergent for food use

A new detergent sanitiser has been developed by Reddish Chemical Company. The detergent is harmless to hands and metals including aluminium, is safe on glass-lined vessels, is freely rinseable and reduces bacteria counts to a minimum.

Super Kinray Plus is suggested for uses throughout the food industry and Reddish claims it is invaluable as a one stage cleaner and sanitiser for all types of equipment.

(*Fishing News International* 21(2); 1982; 51)

76 Everest H.R. Coating

A specialised coating with heat resistant and anti-corrosive properties has been introduced for the first time in India. It also gives protection from gases, rains, and acidic fumes. Being easy of application direct to the bare metal/surface and being fast drying (air drying) free from obnoxious odours have been quite convenient to use. It does not get peeled off, destroyed, burnt or even tarnished. Its inertness even to petrol, hexane, acetone and numerous solvents, enables to be used for solvent vessel, tanks, reaction/distillation kettles and units and is preferred even to epoxy for its improved properties and economy in cost. For further information contact : Mani Kant Brothers, 311, Anant Bhuvan, 257, Natha St., Bombay 400009.

TRANSFER OF TECHNOLOGY AND NEW INDUSTRIES

277 Malathion technical

The Ultra Rasayan Udyog Ltd., has commissioned its malathion technical plant at Sikandrabad Industrial Area, U.P. The plant has capacity to produce 1,000 tonnes of malathion technical per annum.

(*The Chemical Times* March 1, 1982; p 5)

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RAW MATERIALS

278 Off-flavour in fish

Off-flavours, especially that of mud, have been reported in fish, both in cultured as well as wild fish. By taste and chemical analyses, geosmin has been identified as the primary compound responsible for this "muddy" or "musty" off-flavour. This is the predominant type of environment-related off-flavour in fish and has been found in cultured and wild fish all over the world. Recently other types of off-flavours like "metallic"; "chemical", "grassy", etc. have also been noticed in fish from intensively-fed ponds.

(Marine Fisheries Information Service No. 39; 1982)

STORAGE AND INFESTATION CONTROL

279 Enzyme to extend shelf life of fresh fish

URI Sea Grant Project scientists say that they have achieved a 50 per cent increase in the shelf life of fresh fish through use of a commercially available enzyme. By either dipping the fish in the enzymatic solution or keeping it on ice to which the enzyme has been added, bacterial deterioration is slowed. It was found that the enzyme glucose oxidase when added to minced fish would slow down spoilage. Further microbiological tests showed that the use of the enzyme helped whole winter flounder, and fillets, do better in sensory tests and Torry meter measurements, and that the surface pH of the fish stayed lower and longer.

(Fishing News International 21(7); 1982; 20)

280 Electronic insect killer

Teckno Plastics have developed an electronic insect killer, which automatically destroys flying insects, mosquitoes, lawn moths, bugs, flies, wasps, gnats, etc. The device uses a 4-watt fluorescent (replaceable) tube, Type A, in the range of 315-430 nanometers. This light attracts insects, which are electrocuted on the electronic grid and fall into a container for disposal. The normal grid voltage of 2,400 DC is harmless due to its low current if accidentally touched. The device has no odour, does not emit smoke or vapour, and uses no spray, chemicals

or insecticides. The unit attracts insects in an area of about 15 sq.m. It takes 6 W when in operation and uses domestic power supply.
(*Industrial Products Finder* 10(11); 1982; 45)

281 Microencapsulated insecticide

Pyrethrins noted for being a low toxic, potent and versatile insecticide have one major flaw - an extremely short life. "Sectrol", a new insecticide being introduced by 3 M, eliminates this problem. "Sectrol" is an insecticide utilizing natural synergized pyrethrins in conjunction with a 3M technology called micro-encapsulation that extends the killing action of these pyrethrins up to 60 days. It has been approved by Agriculture Canada for general spray in food areas. "Sectrol" has low toxicity, can be used on many surfaces and is effective on a wide range of insects.

(*Food in Canada* 41(7); 1981; 88)

282 Cockroach killer

The Oecos Electro Roach Trap, which destroys cockroaches without the use of insecticides, has been developed by Oecos Scientific Ltd.

Cockroaches, like many other insects, produce chemicals known as pheromones which have an irresistible attraction for others of the same species. The Oecos Trap employs a capsule containing a synthetic "copy" of these chemicals with the same attraction for the cockroach. Having been lured into the trap, the cockroach is subjected to an intermittent electric shock, causing it to fall upon, and be retained by, a replaceable sticky pad from which it cannot escape. The electric impulse is an essential part of the trap as it has been found that cockroaches naturally avoid contact with sticky surfaces.

(*Food Trade Review* 51(11); 1981; 629)

283 Freezing foods without free water

Food Processing reports on a technique for freezing foods which is said to save energy both in processing and storage. Freeze-FloTM foods require storage at -6 C rather than the -17 C for traditionally frozen foods. And if the food accidentally thaws refreezing usually can be safely accomplished. The technique prevents separation and build-up of free water, thus slowing bacteriological increase. It also avoids problems of crystallization and gumming. While technique has only been tested with a few foods, hope is that it can be widely used with frozen

foods and that it can lengthen the shelf life of bakery products and other foods now stored at room temperature.

(*Agricultural Engineering* 62(3); 1981; 9)

FOOD ADDITIVES

284 Shelf life extender for sweet doughs

A new concentrate especially formulated to provide shelf life in excess of eight days for sweet doughs has been introduced by Basic Foods. Called Soft-n-Rich, the new concentrate is a special blend of ingredients that allows bakers to offer products that retain freshness, flavour and appearance longer than sweet dough concentrates before available. It also offers consistent product quality and uniformity as the product has no non-functioning ingredients. Soft-n-Rich is usable in any existing dough preparation and make-up system and handles easily on all types of make-up equipment. Soft-n-Rich is available in 50-pound concentrate cartons and is shipped in poly shrink wrapped skids. Basic says that Soft-n-Rich can be stored at room temperature and that the stored product requires as much as a third less storage space.

(*Baker's Digest* 55(4); 1981; 52)

285 Natural fish base

Natural "Fish Base" may be used undiluted as a seasoning for quenelles, fish cakes, fish sticks, breadings, dips, and spreads, or it may be reconstituted in boiling water to make a fish stock for use in sauces, soups, chowders, fish entrees, and stews. One lb of the base produces 4 gal of stock. The primary ingredients of the base are cooked fresh fish and concentrated fish stock. Only certain varieties of North Atlantic flatfish are used in base which possesses a moist, puree-like consistency. The base is available in 1- to 50-lb packages.

(*Food Technology* 35(1); 1981; 102)

286 Vanilla bean flavor

Artificial spray dried vanilla bean flavour, a product of approximately 10 fold strength, duplicates many of the flavour nuances of pure vanilla extract. When used as directed, a creamy vanilla bean character is imparted to a variety of products such as convenience foods, desserts,

cake mixes, icings and other baked goods. In addition, the free flowing characteristics of this flavouring make it ideal for blending with other powdered ingredients in a food formulation. Recommended use is 2-3 ounces per 100 pounds of product.

(*Baker's Digest* 55(6); 1981; 49)

287 Vanillin/chocolate replacement

David Michael & Co Inc of 10801 Decatur Road, Philadelphia, Pa 19154, USA, has developed a product designed to be used as a one-to-one replacement for Vanillin. Called Supervan, it can also be used as a chocolate replacer and enhancer. Supervan is available in powder form or as a liquid. All ingredients are FDA approved or are generally recognised as safe. The free flowing white to straw coloured powder has a maximum 7 per cent moisture content and at least 90 per cent of it will pass through a standard US standard 80 mesh sieve.

(*Food Trade Review* 51(11); 1981; 642)

288 Powdered vinegar

A free flowing white powder containing 50% free acid and retaining its strong vinegar flavour and aroma over time has been developed by Benckiser Inc., U.S.A. The product which is soluble in water to yield a clear solution, can be added to convenience foods, vegetables, soup and sauce, dry concentrates, fruit powders and spice blends.

(*PFNDAI Newsletter* No. 25; 1982; 5)

PROCESSES

289 Rice flour granulation and extrusion

Rice flours of different granulations - over 30 mesh, 30-50 mesh, 50-80 mesh, and through 80 mesh were processed using the Wenger X-5 extruder with a 1/8" die and at an exit temperature of 95 C. With increased fineness of the flour, the expansion ratio, water absorption index and water solubility index of the product increased from 1.4, 4.91, 0.016 to 2.6, 7.16 and 0.027, respectively. The extent of gelatinization of the starch component increased from 36.1% to 55.1% as the flour granulation became finer. This was also supported by the amylograph paste viscosity data. E.R.H. - moisture and breaking strength relations evaluated by the INSTRON system, showed that crispness score was highly

correlated with the breaking strength of 11.5 kg corresponding to 6.56% moisture in the product equilibrated at 43% R.H.

(*LEC Newsletter* 6(2); 1982; 6)

290 Processing of fruit preserves

Line of Fruit Preserves may be handled and stored on a non-refrigerated basis for extended periods of time. The preserves are cooked and concentrated at low temperatures under a vacuum. Then, they are sterilized and packaged in a closed aseptic environment. The rapid heating and cooling of the product during the process reportedly allows the preserves to retain their natural colours and flavours, and does not injure the fruit fiber.

(*Food Technology* 35(11); 1981; 80)

291 Fish sausage processing methods

A method of producing a new line of fish sausage products, generally recognized as an excellent source of protein and processed from normally underutilized fish is being offered. Proteins running in these products are of high biological value with excellent amino acid profiles. Earlier attempts to utilize automatically deboned meat to produce fish sticks and portions were discouraged due to a colour problem. The new sausage products overcome this problem because visually, non-homogenous are typical to coarse ground sausage.

A great deal of processing equipment is eliminated including smoke house. The preparation is extremely simple as well as economical. Applicable mixtures of spices, soy, liquid smoke flavouring, sodium nitrate and sodium tripolyphosphate are standard although varying in amounts to meet any of the many desired products. Taste tests have been superior and distinctive new products have been developed. Soy, TPP and water significantly affect the texture but not the flavour. Storage studies have developed no problems with no significant bacteria counts.

(*Food in Canada* 41(7); 1981; 84-85)

292 Activated clay for refined oil processing

Activated clay is essential in vegetable oil industry for decolouring neutralized oil during the production of refined oil. The Thailand Institute of Scientific and Technological Research is working on the

production process of activated clay by using local bentonite mixed with montmorillonite. The chemical and physical properties of the clay have a great effect on the decolourising power. Experimental results, according to the Institute sources, have shown that about 80 per cent of activated clay powder was obtained by digesting clay with dilute hydrochloric and sulphuric acid at a high temperature, filtered, roasted and then ground.

The decolouring efficiency of the experimental clay is as good as that of the one used by vegetable oil industry at present. The acid value of the oil thus decolourised was found to be comparatively low. Moreover the contaminant elements like ferrous, copper, lead, etc. in the oil were not increased. Feasibility analysis of a plant with 2 tonne per day capacity shows that the project will begin to earn profit in the second year of operation. Internal rate of return approximated to 23 per cent against a pay back period of five years.

(Oils and Oilseeds Journal 34(4/5/6); 1981; 39)

BYPRODUCTS AND WASTE UTILIZATION

Nil

PROCESSED PRODUCTS

293 Processed food fibre

The Citrus Central Inc., U.S.A. have marketed a dried citrus fibre with potential uses in processed meats, breakfast cereals, baking goods and health foods. The fibre derived from washed juice sacs of citrus fruits consists of 46% dietary fibre and is available both in the flaked and the ground forms.

(PFNDAI Newsletter No.25; 1982; 5)

294 Coconut concentrate

Natural Coconut Concentrate #7000 is a liquid concentrate that may be used in yogurt, ice cream, and pasteurized beverage products. The product, which is reportedly 3-4 times more concentrated than standard forms of coconut milk, is heat stable and does not require refrigeration. The concentrate is readily dispersible in water.

(Food Technology 35(12); 1981; 90)

295 Spice and vegetable extracts

A line of SPICE-SOL-E products is available for Durkee Industrial Spices and Seasonings/SCM Corp. These products are natural spice or vegetable extracts which are encapsulated in a carbohydrate matrix specially designed to retain volatile flavour and aroma components and protect against oxidative deterioration. Controlled release of this matrix is achieved through hot or cold water solubility. SPICE-SOL-E products exhibit superior flavour and aroma because the volatile components are protected until dissolved in water. Like liquid spice extractives, they offer superior microbiological characteristics, absence of foreign materials and freedom from crop and seasonal variations. However, SPICE-SOL-E products are dry, stable, free-flowing, and easily incorporated into dry mix applications. Applications for SPICE-SOL-E products include: dry soup mixes, drink mixes, salad dressings, desserts, sauces and gravies and bakery products. Available at this time are cinnamon and black pepper spice flavours; vegetable flavours in onion and garlic; and spice colours in paprika and turmeric.

(*Baker's Digest* 55(4); 1981; 52)

296 Microbial coagulant for cheese making

A new microbial enzyme, called New Marzyme, with heat sensitive characteristics has been developed by Miles Laboratories, U.S.A. for use in all types of cheeses. The microbial coagulant reduces processing problems and enzyme carryover in the finished products when subjected to normal whey processing technique.

(*PFNDAI Newsletter* No. 25; 1982; 5)

EQUIPMENT AND MACHINERY

297 Weigh system for flour and water

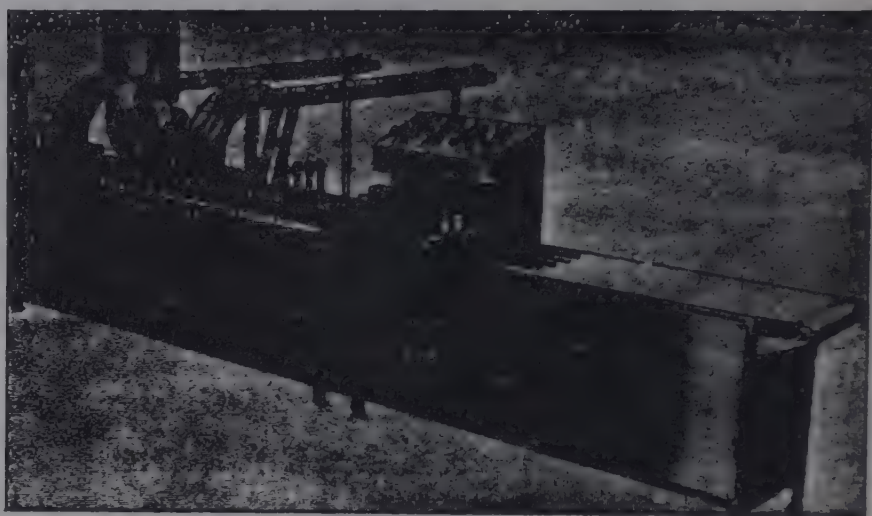
A system to weigh flour and water simultaneously has been developed by ABS, the West German bulk flour storage specialists. It delivers water to a storage tank until the preselected weight has been attained. An electronic control then turns off the water and automatically calls off the flour from a silo until the weigh hopper signals that the required weight has been drawn through. The unit then switches itself off until the baker is ready to empty the contents either separately or together

into the mixing bowl. Further advantages of this combined weighing system are an electronic thermocouple which measures the temperature of the water flowing to, as well as the water already in, the tank, and regulates the hot and cold delivery to ensure the exact water temperature required is maintained to an accuracy of plus or minus 1 C. This ABS unit is being marketed throughout the UK and Eire by Kerry Handling Ltd. of High Street, East Grinstead, Sussex.

(*Food Trade Review* 51(4); 1981; 187)

298 Biscuit cream sandwiching machine

Automac automatic biscuit cream sandwiching machine has a capacity of 200 to 250 pieces a minute depending on the size and uniformity of the biscuits. It incorporates infinitely variable speed mechanism. Programme control system by means of micro-switch attachment avoids breakage of biscuits and wastage of cream. The sizes of biscuits and cream can be changed with a cream shaping disc and a little adjustment.



(*Industrial Products Finder* 10(11); 1982; 53)

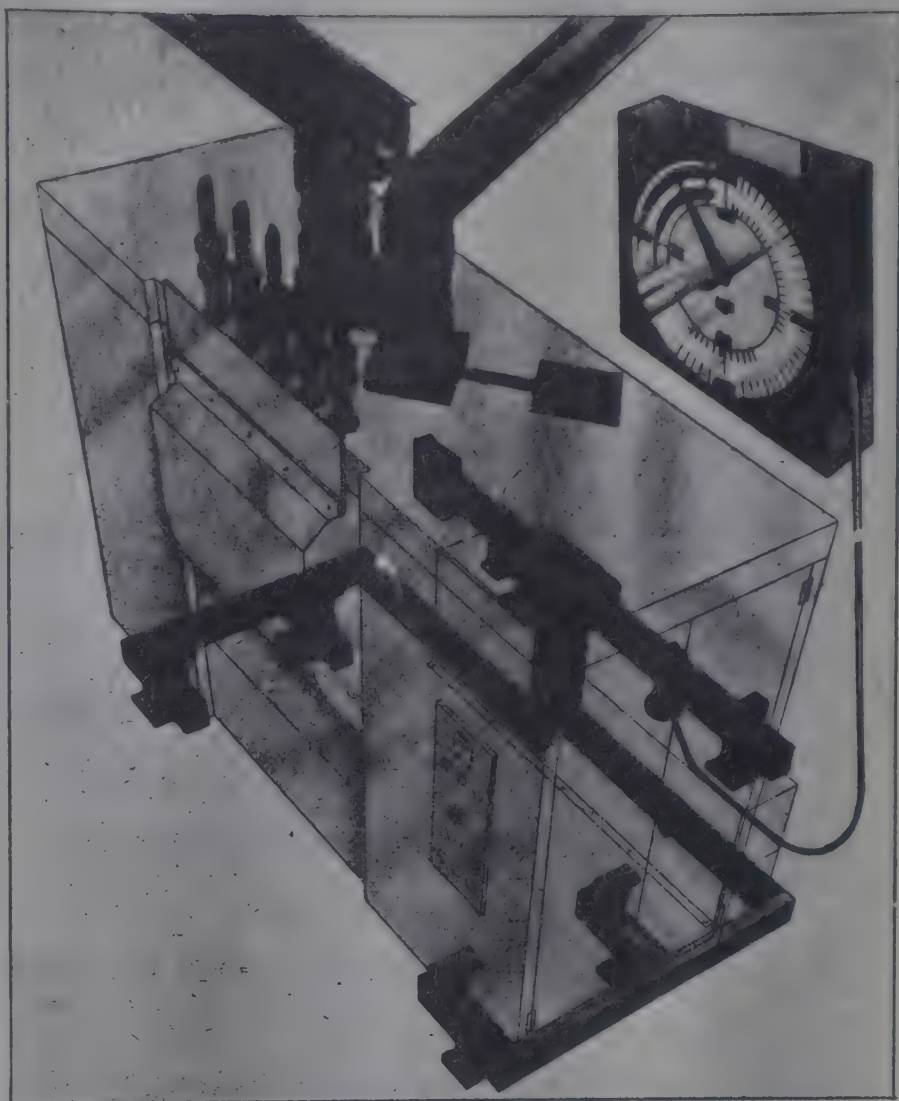
299 Accurate proportioning of wet and dry ingredients

A new concept, which will allow the biscuit and allied industries to convert existing or new mixers into an integral weighing system, that will handle both solid and liquid ingredients, has been announced by Simon Food Engineers Ltd. of P.O. Box 31, Stockport, Cheshire SK3 0RT. Designated as the Weighmix, the system has been designed to ensure that a mixer will receive exact quantities of ingredients into the mixing vessel. This overcomes the problems associated with external weighing systems, such as the loss of material in weigh hoppers, conveying piping, service bins, etc, for solid ingredients and inconsistencies with metering pumps, inline displacement meters and possible density changes for liquids.

The Weighmix incorporates a low profile weighbeam pneumatic load cell

system that is capable of 'backing off' the weight of the mixer, which may be several tons, whilst accurately registering the addition of both large and small quantities of ingredients in the recipe, and offering the facility of an accumulative total to enable the detection of sizeable hand additives. The mixer sits on weighbeams and a system of levers transmits the load to a sensing beam where increases in weight, from as low as 5 kg to as high as 500 kg, are registered. A dual scale displays ranges of 0-100 kg and 0-800 kg for accurate indication of small and large quantities and on completion of the full mixing cycle, displays the total weight of all the ingredients which have been added.

(*Food Trade Review* 51(5); 1981; 243)



300 Hopper magnets

Hopper magnets offered by Premier Enterprises provide efficient magnetic filtering in any hopper-fed machinery such as flour mills, rice mills, and cattle feed plants. Made out of high coercivity permanent magnets, they provide complete protection from damage due to stray iron pieces. Easy to clean and install, the magnet can be designed to suit any size and shape of hopper.

(*Industrial Products Finder* 10(5); 1982; 2)

301 Boulton vibro-energy superclean separators

The new Boulton Vibro Energy Superclean Separators have been specially designed to meet the strict requirements of the food and other industries where contamination of product must be prevented. Utilising

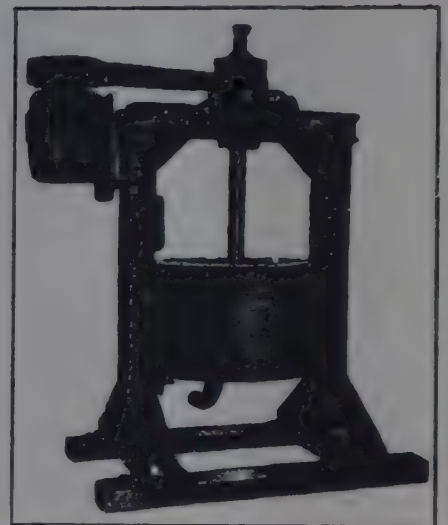
the well known Vibro Energy system, these machines provide fast, high efficiency sieving of materials, wet or dry, coarse or fine.

Emphasis has been placed on designing a highly polished unit which has no crevices or angles where the material being sieved will lodge, and the whole unit can be supplied totally enclosed to prevent atmospheric contamination. Precision made no gaskets are used and the complete screening section can be quickly removed for easy cleaning.

(*Food Trade Review* 51(4); 1981; 184)

302 Centrifugal machine

Meerut Steel manufactures a centrifugal machine in three models for chemical and sugar industries. The machine frame is very sturdy and is made of heavy steel sections. The inner and the outer drums are made of 6 mm and 3 mm thick steel plate, respectively. The rotating cage is balanced by dynamic balancing machine. Model 918 comes with a cage size of 225 mm h x 450 mm dia, Model 1224 of 300 mm x 600 mm; and Model 1836 of 450 mm x 900 mm. The respective speeds are 2,000, 1,800 and 1,500 RPM. The machines are operated by 5 HP, 7.5 HP and 15 HP motors in that order.



Their sugar making capacity per hour is 150 kg, 250 kg and 450 kg.

(*Industrial Products Finder* 10(11); 1982; 79)

303 New spray mixing process

By adopting a novel approach to the mixing of powders with liquids, the Claudius Peters Group of Abbey House, Farnborough Road, Farnborough, Hampshire GU14 7NA, has developed an economical process that is applicable to many requirements. Known as Spraymixer and protected by patents, the new processing system is unusual in that the mixture is produced in air by spraying both solid and liquid components into a mixing chamber. Droplets of the liquid become coated with the powdered solid. The result is a homogeneous, dry and free-flowing product which is easy to handle.

When compared to the conventional method of mixing all components as liquids, and subsequently drying the mixture. Spraymixer saves the heat that would be required for the drying process. Again, its energy consumption is low in relation to a mechanical process with mixing blades.

Owing to the lack of mechanical shear, the new process is gentle and causes no product degradation. Also contributing to the low running costs is the fact that the process is continuous and fully automatic, so only the minimum of operating personnel is required. All process variables can be controlled precisely to obtain exceptionally accurate mixes. Spraymixer is a versatile process system: not only has this design of plant proved to be successful in mixing applications but it also shows considerable promise for rewet instantizing and chemical reactions.

(*Food Trade Review* 51(5); 1981; 244)

304 Rice hulling and polishing equipment

A breakthrough in the technology of hulling and polishing rice paddy is claimed by Christy & Norris Ltd of 171 Broomfield Road, Chelmsford, Essex. Consistent results giving 98 per cent hulling efficiency, and as low as 4 per cent broken grains in the polished product, have been achieved. The machine design incorporates a hulling section, an aspirating section for the removal of hull from the rice and a polishing and screen section for the removal of bran created when producing white rice.

The machine uses an entirely different principle to other machines on the market in that the hulling section incorporates a series of opposite rotating discs coated with a special plastics finish. The rice grains are fed between these discs which, because of their rotating action, cause the hulls to be removed from the rice. A simple fan system blows the hull from the brown rice prior to delivery of the brown rice into the polishing section. The polishing section also uses a series of discs operating in pairs. These discs are coated with a particularly hard abrasive substance which causes the polishing action.

A screen is fitted below the polisher to remove the bran from the white rice, leaving a clean unbroken sample. The new huller is capable of dealing with rice paddy with moisture contents up to 15 per cent. The capacity of the new Christy unit is reckoned to be 400-700 kg per hour of polished rice.

(*Food Trade Review* 51(4); 1981; 186)

305 Extrusion of sorghum beneficial

Preliminary reports from Drs. George Graham's and William MacLean's metabolic laboratory in Lima, Peru indicate greatly increased digestibility of extrusion cooked sorghum. Samples of sorghum were decorticated

followed by LEC extrusion prior to their use in feeding infants. The combination of dehulling with extrusion processing increased the protein nutritive value of sorghum when compared to the whole grain sorghum.

(*LEC Newsletter* 6(2); 1982; 3)

306 Oven cleaner

An oven cleaner now available from Dimex Ltd claims to have overcome the problem of evil smelling fumes. Dimex Oven Cleaner is based on sodium hydroxide with additives which are said to boost degreasing properties. It is supplied as a thick liquid and should be applied with a brush.

The company warns that although it is safe to use on most surfaces it should not be left on aluminium or stainless steel for more than a few minutes.

(*Baking today* 2(6); 1981; 43)

307 Nara paddle dryer

The Nara paddle dryer is a contact dryer designed for processing powders, granules and filter cakes which cannot be successfully or economically dried in spray, flash or fluidised bed units. Other duties include cooling and heating. Additionally when converted to a closed cycle system, the Nara can be used for solvent stripping and recovery operations. The air volume requirement is only 5-10 per cent of that necessary for direct air contact dryers and the resultant energy saving is further increased by steam consumption as low as 1.2 kg per kg of water evaporated.

The Nara dries particles by bringing them into contact with a series of heated wedge shaped hollow paddles mounted on parallel shafts.

The paddles slowly revolve and agitate the material to be dried. The design concept ensures that at all times both sides of the paddles are in contact with the material being processed. This feature produces a self cleaning action. The heating medium, be it water, steam or oil, circulates through the paddles via the hollow drive shafts and through the jacket. Material is continuously fed into the top of the dryer at one end and



moisture removed by the drying action, withdrawn from the other. Product discharge is from a rotary valve situated on the underside of the unit at the opposite end to the feed point.

(*Food Trade Review* 51(6); 1981; 298)

308 Microwave vacuum driers

Microwave vacuum driers in tower, rotary, and conveyor designs may be used to dry free-flowing products (coffee and oilseeds), high moisture products (brewers grain, citrus pulp, and cannery waste) fragile products (croutons, pellets, and nuts), and heat-sensitive products (protein, seeds, and vitamins).

(*Food Technology* 35(8); 1981; 78)

309 Industrial dehumidifiers

Arctic India offer dehumidifiers that dehumidify air by a process of continuous physical adsorption and regeneration through a desiccant. It works by rotating the desiccant beds continuously through two compartments isolated by silastic seals. One compartment dehumidifies the air by adsorption and delivers a continuous supply of desert dry air, while the desiccant beds are regenerated in the other compartment. Dehumidifiers in capacities from 50 to 30,000 cfm are offered.

(*PFNDAI Newsletter* No. 23; 1982; 2)

310 Ovenable food tray

This Kya Ovenware IITM is made of molded fiber and treated with polyester to provide improved strength, heat resistance, and smoothness in design. The tray, which is safe for use in both microwave and conventional ovens (upto 400 F), reportedly will not impart additional taste to its contents, and its polyester treatment serves as a moisture barrier and prevents leakage after reheating. Available in white or beige, the trays perform well on high speed packaging lines and can be lidded with heat-resistant polyester film at speeds exceeding 120 trays/min.

(*Food Technology* 35(11); 1981; 86)

311 Fast/hygienic tea/coffee making

Hot-pot from ASRA of Bombay makes tea and coffee making simple, convenient, fast, hygienic and, money saving. It provides a continuous supply

of hot water, the temperature of which can be preset to the required level by a thermostat. The outer casing of the bottom part is made out of mild steel. The insulated inner container of stainless steel is fitted with an immersion heater. A glass bottle, placed on top, contains additional water, which automatically replenishes the hot water drawn out from the bottom container through a quick-action tap. The design and construction allows for easy cleaning and maintenance.

(Industrial Products Finder 10(5); 1982; 53)

312 Checks chocolate temper

A completely portable instrument, which will enable the temper of chocolate used for moulding, depositing or enrobing, to be checked precisely both in the factory and in the laboratory, has been introduced by Simon Greer Ltd of Newton-le-Willows, Merseyside. Designated the Series 80 Tempermeter, it consists of two units. The main control console contains an inkless chart recorder, which will allow the operator to compile a continuous roll or, alternatively, individual tear-off records. The second module contains three sample tubes and an ice water bath in a thermos bottle. Sample tubes are designed to take a 10g chocolate sample. The state of temper in a batch of chocolate is sensed with a thermistor probe and an extension can be provided for cooling tunnel measurements.

(Food Trade Review 51(11); 1981; 628)

313 Fluid handling components

Chemfluor fluid handling components, made from pure teflon TFE, are stated to be completely inert to such corrosive reagents as boiling aqua regia, hydrofluoric acid, nitric acid, sulphuric acid, and alkalies, as well as to powerful solvents such as boiling hydrocarbons, ketones, esters and alcohols. They are non-contaminating and are, therefore, suitable for ultra-pure fluid transfer applications. They are easy to clean and can be repeatedly sterilised with steam or bactericidal solutions.

(Industrial Products Finder 10(11); 1982; 63)

314 New ice generator

The new Friplat 2 automatic plate ice generator has been designed by Samifi Babcock. The new model has been specifically designed to give a high degree of energy saving and can produce a ton of ice for only 35 KWhr.

It is also very compact and wholly automatic. The three models can produce, respectively, 7, 14 and 20 tons of ice in a day. We are told that it is the only equipment of its kind capable of producing plate ice with no sharp corners or cutting edges which could ruin the product or cause injury to operators.

(*Food Trade Review* 51(11); 1981; 630)

315 Heat recovery equipment

Teknik undertake turnkey projects in heat recovery, material handling and chemical plant technologies. For hotels, chemical and process industries, breweries, dairies and textile and steel industries, Teknik have systems which trap waste heat for use. The waste heat recovery systems include: steam generators, thermic fluid heating systems, hot water generators, hot air generators, and refrigeration system.

(*Industrial Products Finder* 10(9); 1982; 27)

PACKAGING

316 Paperboard carton for nonrefrigerated juices

Paperboard carton, for use in extending the shelf life of nonrefrigerated juices, is described in the 6-p brochure "The Carton That Came in From the Cold". According to the brochure, juices packaged in the carton have a shelf life of 3-6 months. The brochure describes advantages of the hot-fill process carton, and it discusses the carton's 6-layer construction.

(*Food Technology* 35(9); 1981; 134)

317 Oils in polypacks

The government plans to market vanaspati and edible oils in polythene packets in order to reduce the consumer price of these commodities. The proposal of the civil supplies ministry for this scheme is pending for clearance before the Health Ministry. The programme for polythene packaging will commence as soon as the proposal is cleared. This was disclosed by the Union Agriculture and Civil Supplies Minister Hon'ble Shri Rao Birendra Singh while addressing members of the Parliamentary Consultative Committee attached to the Ministry. He said that the public sector Ganesh Flour Mills will soon introduce smaller packs of imported edible oils for

sale in Bombay, Calcutta, Delhi and Madras.

(*Packaging Digest* 9(1); 1982; 8)

318 Reclosable and reusable pouches and bags

Plastic based reclosable, reusable pouches and bags are now introduced by Messrs. Jayna Packaging Pvt. Ltd. (205 Kakad Chambers, 132 Dr. A. Besant Road, Bombay-18). This system is said to offer many advantages both from its utility and application. It has a contour seal head which can be easily locked together to achieve an effective closure and at the same time is easy to open. This has been extended to cover more sensitive areas of application by using laminated materials instead of ordinary plastic alone.

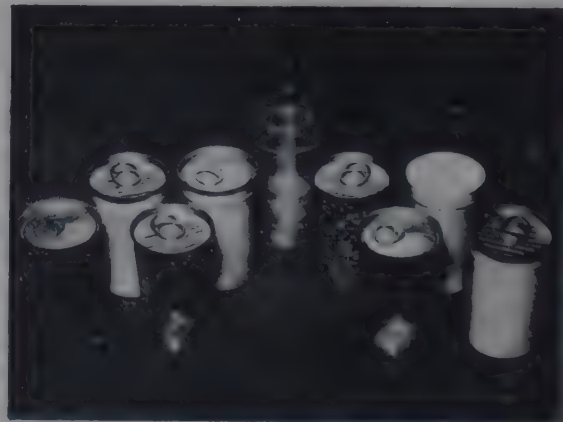
This could also be used for packing of sensitive food products and photographic materials and chemicals and similar items. The company claims that the system offers an excellent seal, facilitating repeated inspection, excellent protection and display value. It can be made available in different sizes to suit packaging of different items and quantities and in different colours. Besides, bags can also be made in different thicknesses for specific strength requirements.

(*Packaging Digest* 9(1); 1982; 8)

319 Plastic cans

Clear plastic can, made from oriented polypropylene, may be used to package such food items as powdered drink mixes, popcorn kernels, snack foods, high-sugar-content syrups and toppings, noncarbonated soft drinks and refrigerated foods such as oysters and crabmeat. The cans reportedly feature glass-like clarity and are able to withstand drop impact, when filled, in excess of 10 ft at temperatures as low as 0 F. The cans are lighter in weight than cans made from other materials and are much lighter than glass. They offer a moisture vapour transmission rate (MVTR) of .25 g/mil/100 in²/24 hr/atmosphere, and they may be hot-filled with product in the 165-190 F range.

(*Food Technology* 35(1); 1981; 112)



320 Solar cooled vans

NICK 'Mr. Fish' Farren, who helped start a mobile fish shop revolution in Britain last year, will soon be launching an export model equipped with an ice machine powered by the sun's energy. Mr. Farren, sole agent for Trader Trailers of Nottingham, is hoping to cash in one of the great constraints on fresh fish consumption in many developing countries - inadequate distribution.

According to Mr. Farren, mobile fish shops equipped with ice makers could give an enormous boost to fish consumption in such countries, most of which also experience long hours of sunshine. Scientific brain behind the development is Dr. Robert Buckley, a deputy school headmaster, who said that the solar powered refrigeration system consists essentially of a number of solar panels, the refrigeration unit itself (in this case an ice machine), and an electronic interface.

The solar panels will be mounted on the roof and side flaps of the firm's "Isolator" insulated trailer, which is claimed to be light and manoeuvrable enough to be easily towed by any reasonably sized saloon car. Although the system has yet to be tested in the refrigerated trailer application, there is "no reason at all" why it should not work, says Dr. Buckley, who claims that with present technology an output of 700 Watts can be obtained from the solar panels of the trailer roof.

(*Fishing News International* 21(8); 1982; 16)

321 Filling machine

The Auto-Fill Model LF is a multi-head rotary vacuum filling machine designed for accurate drip-proof filling of viscous and non-viscous liquids in bottles, jars, cans, etc. The design of the nozzle prevents foaming and aeration, and the machine is suitable for filling squashes, syrups, liquors, pesticides, gums, edible and non-edible oils, etc. Maximum filling capacity is 700 ml, and different models have filling rates from 60 to 240 bottles per minute, depending upon the size of the container. A feedback system provides for quick return of excess liquid to the main tank. All parts coming in contact with the finished product are of stainless steel. An infinitely variable speed drive is provided for accurate adjustment of output as required.

(*PFNDAI Newsletter* No. 23; 1982; 1)

322 Bench model bag filling and weighing machine

A bench mounting version of the Accrapak Series 600 bag filling and weighing machine was exhibited at Powtech '81. A twin-head bag filling/weighing facility, this new machine can handle a wide range of free-flowing materials in powder, pellet or granular forms. The two filling heads are designed to accept plastics bags, paper sacks or similar containers and, for ease of handling, are equipped with snap-action bag clamping.

The supply of material to the bag filling heads is by means of an air operated feed system which ensures positive delivery. The changeover of material delivery at the two heads is automatic as soon as the predetermined contents weight is achieved. The weighing operation is controlled by a deadweight system which can be arranged to deliver any quantity of material upto 25 kg, say Accrapak Systems Ltd of Taylor Industrial Estate, Risley, Warrington WA3 6BL.

(*Food Trade Review* 51(5); 1981; 254)

323 Biscuit wrapping machine

Rovema of Federal Republic of Germany manufacture a machine, the Model DPK, for wrapping biscuits at the rate of 100 bags/minute. The wrapping material may be cellophane and light cellophane laminates or heat-sealable polypropylene/polypropylene laminates. Model DPK is a single-purpose machine intended for lower outputs. It features manual charging section, manual bag length adjustment, and Simplabelt 1:25 drive. The sealing unit consists of a pair of draw-down rollers and a pair of sealing rollers; and cross sealing tools. The machine is fitted with castors as standard equipment and takes up very little floor space.

(*Industrial Products Finder* 10(11); 1982; 4)

ANALYSIS

324 Identification of anaerobic bacteria

Anaerobic Bacteria may be identified using the MinitekTM Anaerobe II Numerical Identification System and Anaerobe II Set. The Numerical Identification System includes a data base for more than 100 different species divided into 4 classes of anaerobes: Anaerobic Cocci, Gram-negative Bacilli, Gram-positive Nonsporeforming Bacilli and Clostridia. Another feature of the system is a section of the code book entitled "Identification Assistan-

ce" which provides characteristics on isolation media, antibiotic susceptibilities, and gas-liquid chromatography. The Anaerobe II Set contains 18 substrates (19 biochemicals), Lombard-Dowell Anaerobe Broth, 20-well plates, and pipette tips sufficient for 50 identifications.

(*Food Technology* 35(1); 1981; 108)

325 Fruit juice test kit

With the introduction by Lumac of the fruit juice test kit, a new, fast and accurate method of sterility testing is available to producers of fruit juices. The test is based on the detection of micro-organisms by a luminescence assay. After a short incubation period, the presence of even a single contaminating organism can be detected. The method is simple to perform and up to 5 days faster than the conventional plate-counting method.

(*Food Trade Review* 51(6); 1981; 300)

326 Continuous lean/fat analysis

A breakthrough in the application of opto-electronic techniques has led to the successful development of the world's first computer-controlled, video-scanning lean/fat analysis system for fresh or frozen meat. With the new system - Glafascan - meat can be scanned and analysed continuously on a production flowline, compared to the present universal practice of measurement by random sampling devices. Fat content accuracy is claimed to be better than plus or minus 1 per cent.

Developed by Micro Measurements Engineering Ltd of Cambridge, in conjunction with Unilever Ltd. and independently tested by the Meat Research Institute, Glafascan is now being launched commercially after nearly four years' field trials. As meat is conveyed under a TV camera it is scanned continuously (50 times a second) and the high quality video image is analysed by computer to give a lean/fat ratio.

The camera image is displayed on the computer console video monitor, as well as monitor screens, and lean/fat percentages are shown by numeric displays and digital readout printers. The data may also be fed directly to a process-control computer. The system is manually set according to the type of meat and is then automatically self-adjusting. If the type of meat is changed, the system can be reset in a few minutes.

(*Food Trade Review* 51(6); 1981; 296)

327 Portable dissolved oxygen/BOD meter

The Model 8500 may be used for wastewater BOD, and other environmental monitoring applications. The meter features a range of 0-20 ppm and a LCD readout. It operates with either a submersible probe for waste water applications or a tapered BOD probe for laboratory use. Both probes are designed to eliminate membrane changing, electrolyte replacement, and the need for mechanical agitators or stirrers.
(*Food Technology* 35(12); 1981; 95)

328 InfraAlyzer

Rapid measurements of protein, oil, moisture, fiber, and other components of food products may be accomplished using the InfraAlyzerTM 400, using near-infrared reflectance techniques to analyze food products, the InfraAlyzer 400 is capable of measuring constituents in 12-20 sec. Sample preparation, calibration, and operation of the instrument are reportedly simple.

(*Food Technology* 35(12); 1981; 96)

329 Viscosity measuring instrument

Viscosities of small quantities of liquids (0.75-1.0 ml) may be measured in the range of $0.1-10^5$ cp using the Model 7.010S Viscometer. The viscometer, which measures viscosity in 6 selectable linear bands, has 100% over-range capability on all ranges with automatic over-range protection above 100%. The instrument's variable density compensation allows the operator to display and record measurements in centistokes, centipoise, and centipoise density units at a constant rate of shear. The instrument provides 0-2 V DC and 4-20 milliamp current outputs to record measurements.
(*Food Technology* 35(11); 1981; 88)

330 Portable densimeter

Stanton Redcroft Ltd. of Copper Mill Lane, London SW17 0BN, have announced a new portable densimeter model DMA 35 giving direct density to three decimal places. The instrument can be held in the hand and the density read out at the temperature shown on the instrument's front. The measuring range is for densities from 0 to 1.999 g per centimetre with an accuracy of plus or minus 0.01 g. The temperature range is 0 to 40 C and the sample required is 1 cc.

(*Food Trade Review* 51(11); 1981; 628)

331 Moisture analyzer

The Hartung system utilizes far infrared drying for more rapid moisture determinations. The system reportedly yields results that are within .1% of those obtained from conventional drying ovens. Able to dry 8-12 samples simultaneously, the system consists of a drying unit which is separate from the balance to eliminate errors due to temperature rise. The far infrared rays are produced by filaments enclosed in ceramic which provide an even field of rays. The cooling unit combines the temperature regulator for the drying unit and a fan to cool down the samples before weighing.

[*Food Technology* 35(9); 1981; 129]

332 Bulk density apparatus

The IEC-5A bulk density apparatus is used for the determination of bulk density of powders in pharmaceutical and chemical industries. A motor moves a shaft carrying clamps at each end to hold graduated cylinders in an up and down direction at a frequency rate between 28-32 cycles per minute through a distance of 5-6 cm. The flanged bottom of the glass cylinders strikes on a cushion fitted on the platform. A timer is provided to preset the time duration.

[*Industrial Products Finder* 10(6); 1982; 59]

333 Infrared liquid analyser

The Anarad (USA) Model 701 is an NDIR liquid analyser with solid-state detector and electronics, utilising narrow bandpass filters to select the optical wavelength of interest. It is based on dual beam system to compensate for the change in line voltage and source temperature. The dual filter/detector system allows compensation for window deposit and turbidity in sample. Typical applications include - detection of H₂O in ethylene dichloride, acetic acid, methanol, ethanol, heavy water, aromatics, hydrocarbon steam, diatomic gases, carbon tetrachloride, liquid ammonia, vegetable oils, benzene and toluene or single component alcohol vapour in terms of as low as 0-50 ppm or 0-1% depending on application. Actual User's Import Licence is required.

[*Industrial Products Finder* 10(5); 1982; 6]

334 Rapid detection of coliforms and streptococci

Fast accurate measurement for bacterial contamination during production is now possible using two new kits introduced by Lumac. The methods are based on luminometry and have been developed by Lumac BV of PO Box 31101, 6370 AC Schaesberg, The Netherlands. The streptococci detection kit permits selective measurement of streptococci after a short incubation. The coliform detection kit selectively measures coliforms and therefore tests the effectiveness of hygiene practices in the production plant. Both methods are up to 5 days faster than conventional plate-counting techniques.

(*Food Trade Review* 51(6); 1981; 297)

COMMERCIAL INTELLIGENCE

PRODUCTION (RAW MATERIAL)

335 All India final estimate of sweet potato, 1980-81

	Area (Thousand hectares)	Production (Thousand tonnes)
Andhra Pradesh	4.1	25.7
Assam	10.0	33.2
Bihar	63.3	422.8
Gujarat	1.0	17.9
Haryana	1.0	18.7
Karnataka	7.7	49.2
Kerala	4.9	32.0
Madhya Pradesh	9.1	52.8
Maharashtra	6.6	90.0
Manipur	0.1	0.5
Meghalaya	4.2	13.0
Nagaland	0.3	0.6
Orissa	51.4	353.2
Punjab	0.5	0.6
Rajasthan	1.9	4.0
Tamil Nadu	4.2	41.1
Tripura	1.5	13.9
Uttar Pradesh	35.0	309.7
Andaman & Nicobar Islands	0.1	0.8
Arunachal Pradesh	0.3	0.9
Delhi	Neg.	0.1
Mizoram	0.7	2.2
Pondicherry	0.1	1.6
ALL INDIA	<u>208.0</u>	<u>1,484.5</u>

(*Agricultural Situation in India* 36(11); 1982; 860)

336 All India final estimate of groundnut, 1980-81

State	Area (Thousand hectares)	Production (Thousand tonnes)
Andhra Pradesh	1,280.0	811.2
Bihar	4.4	5.0
Gujarat	2,124.9	1,644.6
Haryana	6.1	7.8
Himachal Pradesh	1.3	1.4
Karnataka	764.4	457.9
Kerala	14.4	13.5
Madhya Pradesh	330.6	201.9
Maharashtra	832.8	610.7
Orissa	179.8	233.5
Punjab	86.0	107.0
Rajasthan	212.0	85.9
Tamil Nadu	865.5	702.3
Tripura	0.9	0.9
Uttar Pradesh	194.4	132.2
West Bengal	1.2	0.3
Pondicherry	2.9	3.5
TOTAL	6,904.6	5,019.6

Groundnut is not grown to any appreciable extent in States/Territories not mentioned above.

(Agricultural Situation in India 36(11); 1982; 850-851)

337 All India final estimate of rapeseed and mustard, 1980-81

State	Area (Thousand hectares)	Production (Thousand tonnes)
Andhra Pradesh	1.3	0.2
Assam	213.0	102.4
Bihar	81.2	38.8
Gujarat	119.2	55.0
Haryana	301.0	179.0
Himachal Pradesh	5.4	1.3
Jammu & Kashmir	39.9	39.2
Karnataka	3.0	0.7
Madhya Pradesh	212.0	139.3
Maharashtra	4.3	1.3
		contd.

Contd.

State	Area (Thousand hectares)	Production (Thousand tonnes)
Manipur	2.4	1.0
Meghalaya	6.8	4.1
Nagaland	1.1	0.5
Orissa	162.1	72.5
Punjab	132.0	69.0
Rajasthan	362.1	248.0
Tamil Nadu	0.6	0.2
Tripura	3.7	2.7
Uttar Pradesh	2,279.5	1,212.6
West Bengal	131.6	79.2
Delhi	0.8	0.2
ALL INDIA	4,063.0	2,247.2

(Agricultural Situation in India 36(11); 1982; 852)

338 All India final estimate of sesamum (til or gingelly), 1980-81

State	Area (Thousand hectares)	Production (Thousand tonnes)
Andhra Pradesh	181.1	29.5
Assam	12.0	6.0
Bihar	19.7	6.2
Gujarat	91.5	25.7
Haryana	2.0	1.2
Himachal Pradesh	6.4	1.9
Jammu & Kashmir	6.9	1.9
Karnataka	121.3	38.1
Kerala	17.3	4.7
Madhya Pradesh	244.4	36.2
Maharashtra	191.4	36.0
Manipur	1.5	0.7
Meghalaya	0.6	0.3
Nagaland	0.8	0.3
Orissa	191.4	84.4
Punjab	17.3	6.0
Rajasthan	427.8	34.0
Tamil Nadu	96.3	28.9
Tripura	2.5	0.9
Mizoram	1.8	0.6
contd.		

Contd.

State	Area (Thousand hectares)	Production (Thousand tonnes)
Arunachal Pradesh	0.1	0.1
Uttar Pradesh	752.8	63.3
West Bengal	54.9	29.8
Pondicherry	0.7	0.4
ALL INDIA	2,442.5	437.1

(Agricultural Situation in India 36(10); 1982; 786)

339 All India final estimate of safflower, 1980-81

State	Area (Thousand hectares)	Production (Thousand tonnes)
Andhra Pradesh	28.4	7.2
Bihar	0.3	0.1
Karnataka	170.6	84.2
Madhya Pradesh	0.8	0.2
Maharashtra	519.9	245.6
Orissa	6.0	2.8
ALL INDIA	726.0	340.1

(Agricultural Situation in India 36(11); 1982; 853)

340 All India final estimate of linseed, 1980-81

State	Area (Thousand hectares)	Production (Thousand tonnes)
Andhra Pradesh	10.9	2.2
Assam	6.1	2.6
Haryana	97.2	41.0
Himachal Pradesh	0.4	0.2
Jammu & Kashmir	5.8	2.1
Karnataka	2.4	1.4
Madhya Pradesh	56.4	11.0
		contd.

Contd.

State	Area (Thousand hectares)	Production (Thousand tonnes)
Maharashtra	248.5	52.2
Orissa	36.3	16.0
Punjab	1.6	1.0
Rajasthan	42.7	14.4
Uttar Pradesh	578.4	141.7
West Bengal	67.8	19.4
ALL INDIA	1,710.4	427.5

(Agricultural Situation in India 36(11); 1982; 853)

341 All India final estimate of coconut, 1980-81

State	Area (Thousand hectares)	Production (Million nuts)
Andhra Pradesh	42.4	175.2
Assam	5.4	36.3
Karnataka	170.7	883.8
Kerala	666.2	3,036.4
Maharashtra	10.2	61.7
Orissa	22.5	98.8
Tamil Nadu	116.0	1,132.4
Tripura	1.1	1.5
West Bengal	3.3	32.3
Andaman & Nicobar Islands	20.7	97.8
Goa, Daman & Diu	18.7	85.0
Lakshadweep	2.8	20.8
Pondicherry	1.6	15.4
ALL INDIA	1,081.6	5,677.4

(Agricultural Situation in India 36(11); 1982; 854)

342 Statewise trend in the collection of salseed

	Qty : tonnes					
	Madhya Pradesh	Orissa	Bihar	U.P. & H. Pradesh	W. Bengal	Total
1978-79*	8,000	7,500	2,000	500	1,000	19,000
Share in total (%)	42.1	39.5	10.5	2.6	5.3	100
1979-80*	1,70,000	55,000	14,000	2,000	9,000	2,50,000
Share in total (%)	68.0	22.0	5.6	0.8	3.6	100
1980-81*	24,000	22,000	5,500	700	1,100	53,300
Share in total (%)	45.0	41.3	10.3	1.3	2.1	100

Note : *Provisional

(*Economic Times* May 12, 1982, Page III)

343 Inter-ministerial committee set-up for production of edible oils

The amounts spent on import of edible oils during the oil-year 1979-80 and 1980-81 were Rs. 617 crores and Rs. 516 crores respectively. Two high-level inter-Ministerial Co-ordination Committees - one for Rice bran Oil and the other for Soyabean Oil have been constituted in the Ministry of Civil Supplies to look into issues relating to increased production of these oils. A third high-level Inter-Ministerial Committee has been set-up in the Ministry of Agriculture for an indepth study of the problems relating to oilseeds of tree and forest origin so as to enable exploitation of these sources of oil to the-maximum extent possible.

(*Oils and Oilseeds Journal* 34(4/5/6); 1981; 4)

344 Share of selected varieties in the total production of mangoes
- 1980

Variety	Qty. : '000 M.tonnes	
	Estimated production	Percentage Share
Dussehri	680	8.0
Safeda, Banganpalli,		
Benishan	552	6.5
Langra	340	4.0
Totapuri	297	3.5
Fazli	255	3.0
Neelum	255	3.0
Alphonso	170	2.0
Pairi	127	1.5
Chausa	127	1.5

(Profodcil Bulletin 16(4); 1982; 6)

345 Area and production of mangoes in India - 1980

State	Area	Area : in Hectares	
		Production : in '000 tonnes	
		Production	% share in Production
Andhra Pradesh	126560	1614	19
Bihar	129950	1299	15
Gujarat	23000	231	3
Karnataka	38770	271	3
Kerala	62530	788	9
Maharashtra	14800	88	1
Orissa	76500	975	11
Tamil Nadu	34410	481	6
Uttar Pradesh	342000	2009	24
West Bengal	59000	413	5
TOTAL	979640	8516	

(Profodcil Bulletin 16(4); 1982; 5)

346 All India final estimate of dry chillies, 1980-81

State	Area (Thousand hectares)	Production (Thousand tonnes)
Andhra Pradesh	155.9	131.0
Assam	10.8	6.3
Bihar	16.9	20.6
Gujarat	15.8	10.4
Haryana	12.2	13.0
Himachal Pradesh	1.0	0.2
Jammu & Kashmir	1.3	0.6
Karnataka	149.7	46.1
Kerala	0.8	0.7
Madhya Pradesh	54.5	15.9
Maharashtra	151.2	77.1
Manipur	3.2	1.9
Meghalaya	1.4	1.0
Nagaland	1.8	0.7
Orissa	74.1	54.7
Punjab	12.9	11.7
Rajasthan	42.8	16.7
Tamil Nadu	68.6	38.4
Tripura	1.1	0.4
Uttar Pradesh	22.6	19.2
West Bengal	24.8	17.4
Delhi	0.1	0.4
Mizoram	1.8	0.8
Pondicherry	0.1	0.2
ALL INDIA	825.4	485.4

(Agricultural Situation in India 36(11); 1982; 858)

347 All India final estimate of coriander 1981-82

State	Area (Thousand hectares)	Production in terms of coriander seeds (Thousand tonnes)
Andhra Pradesh	91.1	30.7
Bihar	5.7	4.0
Haryana	0.3	0.2
Karnataka	16.1	2.0
Madhya Pradesh	31.9	10.2
Contd.		

Contd.

State	Area (Thousand hectares)	Production in terms of coriander seeds (Thousand tonnes)
Orissa	17.6	8.8
Rajasthan	105.5	56.4
Tamil Nadu	47.6	20.2
Uttar Pradesh	5.6	2.9
ALL INDIA	321.4	135.4

Coriander is not grown to any appreciable extent in States and Union Territories not mentioned above.

(Directorate of Economics and Statistics, Ministry of Agriculture, Government of India, New Delhi)

348 All India final estimate of black pepper, 1981-82

State	Area (Thousand hectares)	Production (Thousand tonnes)
Karnataka	3.07	0.79
Kerala	105.77	28.57
Tamil Nadu	0.44	0.08
Pondicherry	0.01	0.01
ALL INDIA	109.29	29.45

Black pepper is not grown to any appreciable extent in other States/Union Territories not mentioned above.

(Directorate of Economics and Statistics, Ministry of Agriculture, Government of India, New Delhi)

349 All India final estimate of garlic, 1980-81

State	Area (Thousand hectares)	Production in terms of cured dry bulbs (Thousand tonnes)
Andhra Pradesh	0.9	1.4
Bihar	2.9	4.0
Gujarat	18.5	87.1
Haryana	0.2	4.4
Jammu & Kashmir	0.2	0.2
Karnataka	3.5	3.2
Madhya Pradesh	7.8	27.1
Maharashtra	4.6	33.1
Orissa	13.1	32.7
Punjab	0.2	1.5
Rajasthan	2.1	3.9
Tamil Nadu	0.5	2.8
Uttar Pradesh	3.6	11.5
ALL INDIA	58.1	212.9

Garlic is not grown to any appreciable extent in States/Territories not mentioned above.

(Agricultural Situation in India 36(11); 1982; 859)

350 All India final estimate of cardamom, 1981-82

State	Area (Thousand hectares)	Production in terms of dried cured cardamom (Thousand tonnes)
Karnataka	27.8	1.6
Kerala	54.5	3.4
Tamil Nadu	4.5	0.4
ALL INDIA	86.8	5.4

Cardamom is not grown to any appreciable extent in other States and Union Territories not mentioned above.

(Directorate of Economics and Statistics, Ministry of Agriculture, Government of India, New Delhi)

PRODUCTION (INDUSTRIAL)

351 Status of biscuit industry

According to the estimates quoted by the Institute of Economics and Market Research, the production of biscuits by 1983-84 would be 3.71 lakh tonnes. Over the past 5 or 6 years biscuit output has increased by 55%. Production in 1979 was 1.09 lakh tonnes as compared with just 51,620 tonnes in 1966. Fifty per cent of the total biscuit production come from the large sector consisting of 32 manufacturing units. The other 50% come from the small sector. But with biscuit manufacture being reserved exclusively for the small sector under the recent industrial policy, the entire additional requirement will have to come from small units. Biscuits have also found an expanding export market. In the last 10 years, exports have increased 4-fold from 854 tonnes in 1968 to 3,221 tonnes in 1978 valued at Rs. 2.36 crores. Australia, Saudi Arabia, and UAE, Oman and Bahrain are among the countries which import Indian biscuits.

(*Economic Times* May 13, 1982)

EXPORT

352 Exports of mango from India

Year	Quantity	Qty: M.tonnes Value: Rs. in '000 Unit value: Rs. per tonne	
		Value	Unit Value
1977-78	3369	30961	9190
1978-79	4505	37192	8256
1979-80	4294	46791	10897
1980-81 (Apr.-Dec.)	6207	60572	9759

(*Profodcil Bulletin* 16(4); 1982; 10)

353 Sal seed oil a new threat to cocoa

India made sal seed oil fat has emerged as a close substitute for cocoa. In Western Europe and Japan, sal seed fat is used upto 20 to 30 per cent in the manufacture of chocolates along with cocoa. Since Indian Sal seed fat is substantially cheaper than cocoa, the world demand for this material has been growing at a fast pace. Apart from the attractive price, sal seed fat shares with cocoa the unique property of melting in the mouth at body temperature. Sal seed oil does not assume liquid form

unlike other usual vegetable oils and instead hardens at atmospheric temperature. Because of these features, sal seed fat has been steadily gaining popularity as a cocoa-butter extender.

Sal seed oil of good quality fetched this year an f.o.b. price of about Rs. 17,000 per tonne, as compared with about Rs. 11,000 to Rs. 12,000 last year. Exports of sal seed oil are estimated at over 15,000 tonnes this season. This compares with exports of only 5,000 tonnes in 1980-81. During 1979-80, when the crop was fairly normal, exports were to the tune of about 12,000 tonnes.

Sal seed oil and its processed fat together are estimated to have earned foreign exchange of over Rs. 30 crores during this season, as against only Rs. 6 crores in 1980-81. The world demand for sal seed extractions has also brisk in recent years. In 1979-80, exports of extractions which totalled 90,000 tonnes fell to about 40,000 tonnes last year, following the lower crop. Exports have, however, revived this year. At the moment, the f.o.b. price for the extraction is about Rs. 700 per tonne. It is estimated that this year exports of extractions may be well over 100,000 tonnes, fetching at least Rs. 7 crores of foreign exchange.

Japan remains the largest buyer, accounting for almost half the sal seed oil produced in India. While Japan buys unrefined crude oil, Indian exporters of processed products are able to get a higher unit value of about Rs. 27,000 per tonne. In any case, India has utilised only a small portion of the available sal seeds in the country. If India can only collect from its forests all the available sal seeds (estimated at five million tonnes), exports of oil can theoretically fetch over Rs. 1,000 crores at the ruling price. Of course, the market prices will not then remain unchanged. The total collection of the sal seed crop which was about 180,000 tonnes in 1979-80 fell drastically to 35,000 tonnes in 1980-81. The collection has recovered this season to an estimated 120,000 tonnes, accounting for an oil production of about 15,600 tonnes (on the basis of about 13 per cent oil recovery).

(Oils and Oilseeds Journal 34(4/5/6); 1981; 40-41)

354 Exports of spices from India during 1981-82

Quantity: M.tonnes
Value : '000 Rupees

<u>Commodities</u>	<u>Quantity</u>	<u>Value</u>
Pepper	20,531.38	2,77,037.25
Dehy. Green Pepper	48.82	2,129.48
Pepper powder	20.03	395.99
White pepper	7.67	274.31
Total pepper	20,607.90	2,79,837.03
Cardamom small	2,385.93	3,11,106.25
Cardamom big	97.73	1,985.69
Chillies	3,867.30	35,211.73
Chillies powder	791.94	6,847.96
Total Chillies	4,659.24	42,059.69
Ginger	4,690.06	39,174.46
Ginger powder	27.74	348.24
Total ginger	4,717.80	39,522.70
Turmeric	9,556.74	41,472.52
Turmeric powder	2,429.17	10,270.15
Total turmeric	11,985.91	51,742.67
Curry powder	1,805.00	20,018.07
Coriander seed	1,557.39	10,766.95
Coriander powder	171.76	1,566.49
Total coriander	1,729.15	12,333.44
Cumin seed	6,391.17	68,338.57
Cumin powder	14.26	192.56
Total cumin	6,405.43	68,531.13
Celery seed	1,668.06	11,170.43
Celery powder	-	-
Total celery	1,668.06	11,170.43
Fennel seed	1,032.39	8,863.97
Fennel powder	1.03	10.36
Total fennel	1,033.42	8,874.33
Fenugreek seed	3,221.70	13,287.64
Fenugreek powder	19.67	104.17
Total fenugreek	3,241.46	13,391.81
Garlic	5,559.08	19,858.53
Dehy. garlic	509.96	6,261.17
Garlic powder	37.61	385.90
Total garlic	6,106.65	26,505.60
Nutmeg	0.31	9.71
Nutmeg powder	-	-
Total nutmeg	0.31	9.71
Aniseed	1.00	8.10
Cassia	567.55	7,290.01
Cassia powder	-	-
Total cassia	567.55	7,290.01
Tejpat	79.21	243.03
Tejpat powder	8.25	15.66
Total tejpat	87.46	258.69
Misc. spices	1,096.95	6,605.53
Oils of spices	16.59	4,954.43
Oleoresins of spices	166.76	26,261.08
Total	<u>68,380.30</u>	<u>9,32,466.39</u>

355 Groundnut export duty halved

The Central Government has decided to reduce the export duty on groundnut kernel from Rs. 3,000 a tonne to Rs. 1,500 a tonne and on groundnut in shell from Rs. 2,250 a tonne to Rs. 1,125 a tonne with effect from October 20. This measure follows the fall in international prices of HPS groundnut.

(Oils and Oilseeds 34(4/5/6); 1981; 54)

356 Promoting exports of value-added tea

The Government of India has approved a joint venture proposed for packaging and blending of Indian teas for export purposes between a Calcutta-based Indian company and an Australian company. The base of the joint venture will be Singapore.

Steps are also being taken to renovate the India Tea Centres of London and Sydney. These are to be run on a commercial basis by Indian Tea and Restaurants Ltd., a public sector corporation under the Ministry of Commerce.

India's exports of value-added tea have been growing over the years. Exports of packet tea in 1980-81 were 32.32 million Kgs. valued at Rs. 699.8 million as compared to 30.02 million Kgs. valued at Rs. 580.7 million in 1979-80. Export of tea bags in 1980-81 were 0.75 million Kgs valued at Rs. 32.6 million as compared to 0.49 million Kgs valued at Rs. 20.3 million. Similarly, India's exports of instant tea in 1980-81 were 0.76 million Kgs valued at Rs. 36.6 million as compared to 0.66 million Kgs valued at Rs. 30.5 million in 1979-80.

Tea Board has been undertaking various promotional measures to popularise Indian teas abroad. Besides participation in fairs and exhibitions, tea promotion outside India is conducted through generic and uninational promotion campaigns. Lately, Tea Board has also been encouraging brand promotion of value-added teas and this has had a good response in some West European and Scandinavian markets.

(Economic and Commercial News 12(30); 1982; 3-4)

IMPORT

357 Quantity of edible oils imported

Commodity	Qty : Lakh metric tonnes Value : in crore rupees	
	Oil Year 1979-80	Oil Year 1980-81
Soyabean Oil	5.88	5.41
Raw Palm V. Oil	0.82	0.13
Neutralised Palm Oil	-	0.69
Rapeseed Oil	1.28	1.58
RBD Palm Oil	0.90	0.54
RBD Palmolein	2.61	1.39
Total	11.49	10.74
Value	617.0	516.0

(Oils and Oilseeds Journal 34(4/5/6); 1981; 31)

TRADE INFORMATION

358 Overseas buyers (importers) of Indian commodities

Rekena & CIA. Lda., AV, 29 De Agosto, 333-Terrugen-2710, Sintra, Portugal are interested in the equipment for the food industries.

Myland Enterprise, Rm. 501 Sunny House, 5th floor, 12-16 Li Yuen St, West, Central District, Hong Kong are interested to import Electronic Products, Machinery, Chemicals, Foodstuff, Hardware.

Mr. Mak Fook Chuen, Buying Controller, Park'n Shop Ltd., G.P.O. 105, Hong Kong, Cashew nuts, HPS groundnuts and the entire range of processed foods suitably packed for sale in Supermarkets.

Mr. Kingsley T. Cheung, Manager, Consumer Division, Connell Bros, Co., (H.K.) Ltd., Room 307, No.9 Ice House Street, Hong Kong, Cashew nuts, HPS groundnuts and the entire range of processed foods suitably packed for sale in supermarkets.

Fintech, 132, Azimpur Road, Dacca-5, Bangladesh. Frozen seafood: details will be sent upon intimation of interest: Industrial salt; in bulk, 10 to 20 thousand metric tons per month for 3 years, Cooking salt; in bulk, 10 to 20 thousand metric tons per month for 3 years, Fish meal; 20,000 metric tons, minimum protein content 65 percent and free of contamination, Cashew nuts: 50,000 metric tons, may be shipped in 4

consignments, processed, cleaned and hygienically packed.

Aziz Enterprise, Dhanialapara, D.T. Road, Chittagong, Bangladesh, are interested in buying different food products among others.

Inter-Mercat O.E., 71, Tsimiski, P.O.Box 1032, Greece Giftware, School-ware, Fruit-Juices, Conserved fruits, Leathers, etc.
(*Indian Export Trade Journal* 36(6/7); 1982)

359 West Asia: importers of mangoes

Bahrain

S.M. Aldarazi & Co.,
P.O. Box 309
Manama
Tel : 253772, 241219
Telex : 8480 BN DARAZI

General Trading & Food Processing
Co.,
P.O.Box 20202
Manama.
Tel : 243006
Telex : 9165 TRAFKO BN

Al Jazira Cold Storage Co.,
P.O.Box 87
Manama
Tel : 712242
Telex : 8312 JAZIRA BN

Alsiaigal Abdulla & Co.,
New Central Market
Manama
Tel : 253996, 252868

Yalia & Alayyan Trading Co.Ltd.,
P.O.Box 436
Shuwaikah-Kuwait
Tel : 813881, 810274
Telex : 2371 ALAYYAN KT

Agricultural Food Products Co.
P.O.Box 24090
Kuwait
Tel : 439809, 445190
Telex : 2776 AFPC KT, 3269 AFPC KT

Ahmad Mohamed Ali Al-Wazan
P.O.Box 124
Kuwait
Tel : 432271
Telex : 2077 MOTTAMAD KWT,
2276 MOTTAMAD 2 KWT

Arabian Trading for Foodstuffs &
Refrigerating Company,
P.O.Box 6807
Kuwait
Tel : 819620
Telex : 2257

Abul Moshin Hasan Al-Wazan
P.O. Box 11058
Kuwait
Tel : 432612

Gulf Fruit & Vegetables Co.
P.O. Box 25335
Kuwait
Tel : 718486

Yemen Arab Republic

Ahmed Moseid Algharasi
Zubeiri Street
Sana'a
Tel : 5532
Telex : 2263

Mohammed Raskhan Kadri
Zubeiri Street
Sana'a
Tel : 7521
Telex : 2418

Hodeida Cold Storage
Hodeida
Telex : 5582

Dhaffer Trading Co.
Hodeida
Telex : 5578

Farah Mohammed Masord,
Taiz

(*Profodcil Bulletin* 16(4); 1982; 31-32)

360 Western Europe : importers of mangoes

Austria

Fruchtunion GmbH & Co. KE
Laxenburgerstrasse 365
A-1232 Vienna-Inzersdorf'

E. Grossmann
Waldmeistergasse 9
A-1140 Vienna

Juhitzer HG Grossmarkt
Laxenbergergerstrasse 365
A-1232 Vienna

Josef Ahorner OHG
Sudbahn-Franchtenbahnhof
Postfach 24
A-1103 Vienna

Fruchtimax G.m.b.H.
Grossmarkt
Laxenburgerstrasse 365
A-1232 Vienna-Inzersdorf

Denmark

FDP (Coop-DENMARK)
Roskildevej 65
DK-2620 Albertslund

IRMA A/S
Gronttorvet 244
DK-2500 Copenhagen-Valby

Interfrugt A/S
Gronttorvet 6,
DK-2500 Copenhagen-Valby

SAMI-frugt Aps.
Gronttorvet 6
DK-2500 Copenhagen-Valby

J.T.H. Oleson
Frugtmarkedet 1
DK-2500 Copenhagen-Valby

J.H. Lembcke A/S
Gronttorvet 226/230
DK-2500 Copenhagen-Valby

Lentz Frugt Import
Gronttorvet 290
DK-2500 Copenhagen-Valby

Kobenhavns Frugtaktioner A/S
Frugtmarkedet 17,
DK-2500 Copenhagen-Valby

Norway

A/L Gartnerhallen
Okern Torgvei 5
Oslo 5

Chr. Mathiessen A/S
Filipstadvein 2 B
POB 2431 Solli
Oslo 2

Norwegian Co-operative Union and
Wholesale Society
Revierstredet 2,
POB 451 Sentrum
Oslo 1

Norgesfrukt A/S
Okern Torgvei 3,
Oslo 5

Unit fruit-Norway A/S
Okern Torgvei 3,
Oslo 5

Norges Fruktgrossisters Forbund
(Norwegian Federation of Fruit
Wholesalers)
Prinsensgaten 2
Oslo 1

Norske agents Landsforbund (NAL)
(Federation of Norwegian Commercial
Agents)
Drammensvn 30
Oslo 2

Gronnsak-og Potetgrossistenes
Landsforbund
(Norwegian Federation of Vegetable
and Potato Wholesalers)
Prinsensgaten 2,
Oslo 1

NORIMPOD
P.O.Box 8147
Dept., Oslo 1
Klingenberggaten 4
Oslo

Sweden

S.J. Norman AB
 Importorsvagen 4
 S-121 73 Johanneshov
 Fruktnorlin AB
 Brunnbyvagen 15,
 Box 9010
 S-121 09 Johanneshov 9

Fruktnorlin AB
 Brunnbyvagen 15,
 Box 9010
 S-121 09 Johanneshov 9

Rune Rydberg AB
 Bruggrevegatan 23
 S-411 03 Goteborg

Kooperative Forbundet (KF)
 Perishables Dept. L.420
 Box 15200
 S=104 65 Stockholm

ICA Frukt och Gronsaker AB
 Landskronavagen 33
 Box 713
 S-251 07 Helsingborg

American Foods AB (subsidiary of
 J.S. Saba AB)
 Importorvagen 5-21
 P.O.Box 9043
 S-121 09 Johanneshov

Netherlands

BUD-Holland B.V.
 Hoornseweg 15,
 P.O.Box 8
 2600 AA Delft

Jos Van Den Berg BV
 's-Gravendi jkwal 95
 P.O.Box 25006,
 Rotterdam

Velleman & Tas B.V.
 19 Marconistraat
 Rotterdam

Van Dijk Delft B.V.
 Hoornseweg 26
 Den Hoorn Post
 Delft

Citronas B.V.
 Keileweg 80
 P.O.Box 6094
 Rotterdam

Windig B.V.
 Centrale Markthal 16-20
 Jan Van Galenstraat 14,
 1051 KL Amsterdam

Fruit Transitokantoor Rotterdam
 BV (ATK)
 Industrieweg 40
 P.O.Box 11080,
 3044 CB Rotterdam

Jac van den Berg BV
 Rochussenstraat 209-A
 3021 NS Rotterdam

361 Importers of spices

Central Indonesian Trading Company Inc., 30 Vessey Street, Room 902, New York, NY 10038	Cardomom & other spices
Furth Louis, Inc. Stewart Avenue Brooklyn, NY 11237	-do-
K.H.L. Flavors, Inc., 70-49 Austin Street, Post Office Box 908, Forest Hills. NY 11375	-do-
Overseas Produce Corp., 129 Halstead Avenue, Post Office Box 296, Mumaroneck, NY 10543.	-do-
Marmorek, Herbett & Son, Post Office Box 36 2153 78th Street, Brooklyn, NY 11214	-do-
McLintock, W.L.Co.,Inc., 214 Front Street, San Francisco, CA 94111	-do-
Produce Dealers Corp., Affiliated with Walter 1., Willner Company, Inc. 11 Broad way, New York, NY 10004.	-do-
M/s Metropol Trading Co., Export and Import, Storgatan II, S-411 24 Gothenburg, Sweden. Tel: 031-11 6970 Tlx: 20182 Telgot S ATT. MTC	Cardamom Cardamom oil
Rajesh Sharma Majid Enterprises P.O.Box: 6470 Sharjah Tel: 352048 SHJ	Cardamom
I.M.S. Oberoi Leman Group P.O.Box 159, Sharjah	Supermarket products including cardamom
Mr. Hussain Arab Universal Agency P.O.Box: 2008, Dubai, U.A.E.	Cardamom and Spices

contd.

Rashidmal Harthy Est.

P.O.Box: 4942

Ruwi,

Tel: 702794,

Cable: 'MUJAHID'

(*Cardamom* 14(7); 1982; 17)

Cardamom

FOOD REGULATION, QUALITY CONTROL AND HYGIENE

REGULATION

362 New regulations for preserves

Proposals for new regulations to govern the composition and labelling of jams, jellies, marmalade, mincemeat and chestnut puree have been issued.

The draft regulations, for the first time, set standards for jams and jellies containing extra fruit, which will be called : "extra jam" and "extra jelly". Standards for traditional jams, jellies and marmalade are revised and, also for the first time, the regulations cover the composition of reduce-sugar jams and jellies.

These regulations, once finalised, will come into effect on August 1st but the compositional requirements will not become obligatory until August 1st 1982 and the labelling provisions not until January 1st 1983.

The proposed regulation would implement the European Community Directive 79/693/EEC and replace the Food Standards (Preserves) Order 1953.
(*Food Trade Review* 51(5); 1981; 240)

363 Whey, whey products, and H₂O₂ are GRAS

FDA has affirmed that whey, reduced-lactose whey, reduced-minerals whey, and whey protein concentrate are GRAS for use as direct human food ingredients and that hydrogen peroxide is GRAS for use as an antimicrobial agent in cheesemaking and whey processing, Details are in the Federal Register of Sept. 4.

(*Food Technology* 35(11); 1981; 27)

364 Tentative GRAS conclusion on some food ingredients

Tentative conclusions on the safety of certain food ingredients have been reached by FASEB's Select Committee on GRAS Substances. Diferrous, dipotassium ferrous, and potassium ferrocyanides are considered GRAS at current use levels and levels that might reasonably be expected in the future. The information available on sodium metasilicate and sodium zinc metasilicate is not sufficient to make a tentative conclusion as to their safety. Details are in the Federal Register of May 29.

(*Food Technology* 35(7); 1981; 71)

365 Fish protein isolate as supplement

FDA has amended the food additive regulations, in response to a petition by Concentrados Marinos, S.A., Lima, Peru, to provide for the use of fish protein isolate as a food supplement. Details are in the Federal Register of July 24.

(*Food Technology* 35(9); 1981; 31)

366 Nitrites are not colour additives

FDA has concluded that nitrites in bacon "fix" rather than "impart" colour and that they are therefore not colour additives. FDA has therefore withdrawn its earlier proposal to exempt nitrites from the definition of "colour additive". FDA also considers it unnecessary to consider further whether nitrites in meat other than bacon qualify for the colour additive exemption and has withdrawn its request for information on that issue. Details are in the Federal Register of Nov. 21.

(*Food Technology* 35(1); 1981; 97)

367 Aspartame safe for use in foods

Disagreeing, with the recommendations of FDA's Public Board of Inquiry that further safety testing is necessary FDA commissioner Arthur Hayes Jr. on July 15 declared G.D. Searle & Co.'s artificial sweetener aspartame to be safe for use as a tabletop sweetener (both tablet and powder forms) and in cold breakfast cereals, chewing gum, and dry bases for beverages, instant coffee, and tea, gelatins, puddings, and fillings, and dairy products and toppings.

(*Food Technology* 35(8); 1981; 27)

368 Calcium hypochlorite okay as starch modifier

FDA has amended the food additive regulations to provide for the use of calcium hypochlorite as a modifying agent for food starch used as a component of batter for commercially processed foods. Details are in the Federal Register of June 19.

(*Food Technology* 35(8); 1981; 28)

369 Acrylonitrile rule issued by Canada

Canada's Health Protection Branch has issued a regulation prohibiting the sale of any food in a package that may yield to its contents any amount of acrylonitrile, as determined by the official method for that food. Thus, acrylonitrile may continue to be used for food packaging, provided no detectable amount of acrylonitrile is found in the food.

(*Food Technology* 35(11); 1981; 28)

370 Gujarat levies purchase tax on oilcakes

The Gujarat Government has made a provision for levy of purchase tax on purchase instead of sales tax on sale of oilcakes to prevent the evasion of tax. The Governor promulgated an Ordinance on 24th December, amending the Sales Tax Act to this effect.

The oil millers selling goods to registered dealers on prescribed certificates will not have to collect and pay to the Government sales tax on such sales now, but the purchasing dealer will have to pay the tax. Again, the purchasing dealer will not have to pay the purchase tax on resale of purchased goods. The purchase tax will be paid only when purchased oilcakes are not resold.

(*Oils and Oilseeds Journal* 34(4/5/6); 1981; 44)

371 Prevention of Food Adulteration (5th Amendment Rules; 1982)

G.S.R. 476(E). - Whereas certain draft rules further to amend the Prevention of Food Adulteration Rules, 1955 were published as required by Sub-section (I) of Section 23 of the Prevention of Food Adulteration Act 1954 (37 of 1954) with the notification of the Government of India in the Ministry of Health and Family Welfare (Department of Health) No.G.S.R. 469(E) dated 3rd August, 1981 at pages 1449 to 1450 of the Gazette of India (Extraordinary) Part II, Section 3, Sub-Section (i) dated the 3rd August, 1981 for inviting objections and suggestions from all persons likely to be

affected thereby before the expiry of ninety days from the date on which the copies of the official Gazette in which the said notification was published were made available to the public; and whereas the copies of the said Gazette were available to the public on 3rd August 1981; and whereas the objections and suggestions received from the public on the said draft rules have been considered by the Central Government;

Now, therefore, in exercise of the powers conferred by sub-section (1) of Section 23 of the said Act, the Central Government after consultation with the Central Committee for Food Standards, hereby makes the following rules further to amend the Prevention of Food Adulteration Rules, 1955, namely:-

RULES

1. (1) These Rules may be called the Prevention of Food Adulteration (Fifth Amendment) Rules, 1982.

(2) They shall come into force on the date of their publication in the Official Gazette.

2. In the Prevention of Food Adulteration Rules, 1955, in rule 44, after the first proviso, the following further proviso shall be added, namely:-

"Provided that proprietary food articles relating to clause (i), the labels of which are approved under the provisions of rule 37-A, shall be exempted from the operation of this rule".
(Gazette of India (Extraordinary), Part II, Section 3, sub-section (i), June 29, 1982)

372 Gum Karaya Grading and Marketing Rules, 1982

G.S.R. 646 - Whereas a draft of the Gum Karaya Grading and Marketing Rules, 1981 was published, as required by Section 3 of the Agricultural Produce (Grading and Marketing) Act, 1937, (1 of 1937) at pages 2271 to 2274 of the Gazette of India, Part II, Section 3, Sub-section (i), dated the 17th October 1981 under the notification of the Government of India in the Ministry of Rural Reconstruction No.G.S.R. 937, dated the 25th September, 1981, inviting objections and suggestions from all persons likely to be affected thereby before the expiry of the period of forty five days from the date of publication of the said notification in the Official Gazette;

And whereas the copies of the said Gazette were made available to the

public on 2nd November, 1981;

And whereas no objections suggestions in respect of the said draft have been received by the Central Government;

Now, therefore, in exercise of powers conferred by Section 3 of the said Act the Central Government hereby makes the following rules, namely:-

RULES

1. Short title, application and commencement - (1) These rules may be called the Gum Karaya Grading and Marking Rules, 1982;

(2) They shall apply to Gum Karaya Produced in India;

(3) They shall come into force on the date of their publication in the official Gazette.

2. Definitions - In these rules, unless the context otherwise requires-

(1) "Agricultural Marketing Adviser" means the Agricultural Marketing Adviser to the Government of India;

(2) "Schedule" means a Schedule appended to these rules;

(3) "Authorised packer" means a person or a body of persons who has been granted a Certificate of Authorisation by the Agricultural Marketing Adviser, for getting the commodity graded and marked in accordance with grade standards and Procedure prescribed under these rules;

(4) "Certificate" means certificate of authorisation.

3. Grade designation - The grade designation to indicate the quality of the Gum Karaya shall be as set out in Column 1 of Schedule 1.

4. Definition of quality - The quality indicated by the grade designations shall be as set out against each grade designation in columns 2(a) to 4 of Schedule I.

5. Grade designation mark - The grade designation mark shall consist of a label specifying the grade designation and bearing a design consisting of an outline map of India with the word "AGMARK" and figures of the rising sun with the words "Produce of India" and "भारतीय उत्पाद" resembling the mark as set out in Schedule II.

6. Method of marking - (1) The grade designation armark shall be securely affixed to each container in a manner approved by the Agricultural Marketing Adviser.

(2) In addition to the grade designation, the following particulars shall also be clearly marked on the label:-

(a) Crop Season ;

- (b) Net weight;
- (c) Place of packing;
- (d) Date of packing; and
- (e) Any other particulars, as may be specified by the Agricultural Marketing Adviser from time to time.

(3) The authorised packer may, after obtaining the prior approval of the Agricultural Marketing Adviser, mark his private trade mark on a container in a manner approved by the said officer, provided that the private trade mark does not represent a quality of grade of Gum Karaya different from that indicated by the Grade designation mark, affixed to the container in accordance with the rules.

7. Method of packing - (1) Gum Karaya shall be packed in double gunny bags or any other type of container of such capacity and in such a manner as may be specified from time to time by the Agricultural Marketing Adviser. Whilst the inner bag shall be clean and sound, the outer bag shall be completely new.

(2) Packing material shall be clean and dry, free from fungus and insect attack and obnoxious smell.

(3) Each package shall contain Gum Karaya of the same crop season and of the same grade designation.

(4) Each package shall be securely closed and sealed in the manner prescribed by the Agricultural Marketing Adviser.

SCHEDULE 1

(See rules 3 and 4)

Grade designation and definition of quality of Gum Karaya (Crystals) commercially known as Katila, Karaya or Kullo.

contd.

Grade de- sig- na- tion	Definition of quality		Foreign matter percent by wei- ght (Maxi- mum)	General characteristics
	Special characteristics			
	Colour			
	Summer Crop	Winter/Monsoon Crop		
No.1	White with slight grey and yellow cast	Dull white	1.5	Gum Karaya Crystals shall: (1) be derived from the exudes of the plant Sterculia urens, (2) be reasonably dried, uniform in shape and size, (3) be free from rodent excreta, rodent filth and hair, fungus attack, insect infes- tation, (4) have characteristic solubility
No.2	Pale yellow to light tan and brown	Dull white to greyish to amber	3.0	
No.3	Brown and dark brown with slight black cast	Dull yellow to brown dark	5.0	
No.4	Dark brown to black	Dull brown to black	8.0	
No.5	Black and mixed	Black and mixed	10.0	

Definition : Foreign matter: Shall include bark, leaves, dust, dirt, stones pieces or any other organic and inorganic matter other than Gum Karaya.

(Gazette of India, Part II, Section 3, subsection (i), July 31, 1982; 1883-1884)

373 Vegetable oil products control order (Amendment)

G.S.R. 524(E) - In exercise of the powers conferred by sub-clause (1) of clause 4 and sub-clause (1) of clause 4B of the Vegetable Oil Products Control Order, 1947, the Vegetable Oil Products Controller for India hereby makes the following Order further to amend the Order of the Government of India in the Ministry of Civil Supplies No.G.S.R. 717(E), dated the 26th December, 1980, namely:-

In the said Order, in the Table, in the proviso to item 1, in column (1), for the figures, sign, brackets and words "60 per cent (sixty per cent)", the figures, sign, brackets and words "70 per cent (seventy per cent)", shall be substituted.

(Gazette of India (Extraordinary) Part II, Section 3, subsection (i), August 17, 1982)

HYGIENE

374 Excessive intake of garlic may affect male reproduction

Excessive intake of garlic may result in severe damage to the testes, and result in stoppage of sperm production and decrease in testosterone (the male hormone) secretion, according to the researchers, Mr. V.P. Dixit and Mr. Suresh Joshi of the Reproduction Physiology section of the University of Rajasthan. The extent of the testicular damage depends on the dose and the duration of intake. While 45 days administration resulted in degenerative changes, after 70 days' administration, they led to severe damage of the testes and stoppage of sperm genesis. While substantiating the earlier claim that garlic decreased blood cholesterol and blood sugar, they demonstrated that these results were associated with severe testicular damage in animals, on which experiments were conducted.

(*Indian Journal of Experimental Biology* 20(7); 1982; 534-536)

375 Air cleaners for food industry

Electronic Air Cleaners - called Electro-Cell - may be used to remove smoke, haze, mist, and fumes generated by food processing operations. By recirculating air cleaned of these contaminants, excessive energy used to heat or cool make-up air is minimized, resulting in savings. The air cleaners operate on the principle of electrostatic precipitation. Contaminated air is drawn into the unit and first passes through a high intensity electric field created by imposing a positive charge of approximately 14,000 V (DC) on the ionizer wires. Particles are positively charged in this field and then they enter a second electric field of approximately 6,800 V (DC) where they are attracted to and collect on grounded plates. The clean air passes through the air mover and into the return duct system. The air cleaners must be washed periodically to remove contaminants from the collecting plates and several cleaning options are available. The units have air cleaning capacities of 8,000 to 1,95,000 cu ft/min., and are available in a number of design configurations.

(*Food Technology* 35(7); 1981; 66)

TRANSFER OF TECHNOLOGY AND NEW INDUSTRIES

376 Rice bran oil complex

A scheme has been formulated under the Sixth Five Year Plan for setting up modern oil (including rice bran oil) complexes with an estimated outlay of Rs. 10 crores. The details are being worked out.

(*Oils and Oilseeds Journal* 34(4/5/6); 1981; 29)

377 Vanaspati producing units

Government have been helping the vanaspati industry to maintain the production and availability of vanaspati to the maximum practicable extent. Regular supply of oils imported by the State Trading Corporation is being made to the industry. The work of the agencies concerned with the supply of other inputs like coal, power, etc. is also being regularly co-ordinated. As a result of all these steps, the production of vanaspati went up from 6.79 lakh tonnes in the oil-year 1979-80 to about 8.27 lakh tonnes in the oil-year 1980-81, representing an increase of about 21.8% over the year.

Vanaspati Producing Units :

State/UT	No. of installed Vanaspati Units	Installed capacity per day (in M/T)
Andhra Pradesh	6	193
Bihar	3	200
Gujarat	10	332.5
Haryana	4	160
Jammu & Kashmir	1	15
Karnataka	6	78
Kerala	2	35
Madhya Pradesh	3	180
Maharashtra	14	912.2
Punjab	9	465
Rajasthan	6	375
Tamil Nadu	5	143
Uttar Pradesh	11	631.5
West Bengal	6	421
Delhi	2	275
Total	88	4417

(*Oils and Oilseeds Journal* 34(4/5/6); 1981; 48)

PERSONALIA

378 Planning Commission Secretary

Mr. K.V. Ramanathan will be the Secretary of the Planning Commission consequent on Dr. Manmohan Singh, demitting office as member-Secretary of the Commission, according to an official notification.

Dr. Manmohan Singh is taking over as Governor of the Reserve Bank of India on September 15 in place of Dr. I.G. Patel.

(Hindu September 14, 1982; 7)

RAW MATERIALS

Nil

STORAGE AND INFESTATION CONTROL

1. Radiative and evaporative space cooling for short term storage of fresh farm produce.

There is a strongly felt need in third world countries for a low cost, simple device for cooled short term storage of fresh farm produce. In hot dry regions, radiative cooling can be supplemented by evaporative cooling to get larger temperature drop from the ambient. An experimental chamber thermally insulated all round except for the top, which utilised radiative/evaporative cooling has been developed. Inside the chamber, temperature drop of 12 C below the ambient was obtained during the night. If the top is covered with an insulator during daytime the cooled state persists during the day also.

(Indian Energy Abstracts 1(3); 1982; 11)

2. Extending the shelf life of milk

Food Scientists Robert Zall and Joseph Chen at Cornell University, Ithaca, NY, have devised a way to keep milk fresh almost three times longer and to boost production of cheese. A 10-second heat treatment of milk on the farm, before pasteurization, extends the period of freshness, enabling even eight-day-old milk to taste as wholesome and sweet as fresh milk, which usually begins to lose its bouquet after three days. The process means that milk pickups at farms could be made just once a week, instead of every other day. Although normal pasteurization, done immediately prior to packaging, kills more than 99% of the bacteria responsible for milk spoilage, the remaining small numbers can grow under refrigeration, and because consumers hold milk longer than they did in the past, the microbes degrade milk's quality. By blanching milk for 10 sec. optimally at 165 F (74 C) on the farm, its pure, fresh quality will be preserved much longer. Cornell food scientists tested pasteurized packaged milk from two-day-old unheated and 10-day-old heated milk with 1,000 people and no significant differences in taste preference were found.

(Cereal Foods World 26(10); 1981; 576)

3 Extending shelf life of fish

Food scientists at Cornell University, Ithaca, NY, have developed a method that doubles the shelf life of fresh fish. Professor Robert Zall and graduate student Stephen Kelleher have discovered that by blanching fish, dipping it into hot water for two seconds before storing on ice, the time that the freshness of the fish remains excellent almost doubles. According to Zall, blanching fish destroys the bacteria and its enzymes that are responsible for most of fish spoilage, yet the heat never penetrates further than the outer skinlayer. Cornell's food scientists have tested cod and hake, using standard quality measurements. They have found no difference between one-week-old blanched fish and freshly caught fish considering biological, chemical, biochemical, taste, texture, odour, or other sensory factors. The optimal water temperature for blanching is 190 F (88 C) for 2 sec. but quickly steaming fish for two-tenths of a second also will double the shelf life of fresh fish and maintain its quality. (*Cereal Foods World* 26(7); 1981; 358)

4 Flying-insect killer

Following 10 years of research and development, Whitmires' 'Lure Stic' is being marketed as a significant method of killing flying insects without using chemical insecticides. With this concept, three-dimensional fly decoys are printed in various normal positions, and look alive, on bright orange paper rods (dimensions: 610 mm x 50 mm). These decoys trick other flying insects into joining them, where they are totally trapped to die on the sticky surface. The Lure Stic is designed to be effective in food-processing plants, test laboratories, supermarkets and kitchens. (*Food Engineering International* 7(1/2); 1982; 75)

5 Frigoscandia's FiskoFreeze

The Frigoscandia have developed a continuous inline freezer specially for the fishing industry. The FiskoFreeze, has the new hanger system which allows whole product to be hung by the head or nape with specially designed clamps attached to a chain conveyor which conveys product through the air blast freezing chamber. We are told that up to 4500 lb of fish can be frozen per hour under ideal conditions and the speed of freezing means that a whole 5 lb fish can be frozen in around 2.5 hr. In addition to

whole round or headed and gutted fish, smaller seawater or freshwater fish or crustacea can also be handled. For use on board small ships, a mini unit is available. The major advantage of these units is claimed to be the lack of damage to the products. distorted bodies, collapsed bellies or damaged fins are most unlikely with this system.

(*Food Trade Review* 51(2); 1981; 77)

FOOD ADDITIVES

6 New Artificial Sweetener

Biospherics, Inc., Rockville, MD, has received a patent for a no-calorie sugar that could eventually replace saccharin. The product is virtually identical in taste and appearance to regular sugar, but its molecules are arranged in reverse fashion. This "left-handed" or L-sugar cannot be metabolized and thus passes through the body without being absorbed. The company is not yet manufacturing the product on a commercial scale and must receive FDA approval for a new food additive after extensive testing.

(*Cereal Foods World* 26(7); 1981; 357)

7 Sucrose Esters

Dr. Charles Walker and his co-workers in the Department of Food Science and Technology, University of Nebraska, Lincoln, are attempting to develop new sucrose esters from beets and soy.

Sucrose esters have excellent detergent and emulsifier characteristics, and by varying the fatty acid and degree of esterification, products can be created with varying hydrophilic-lipophilic balance values for use in cereal food products.

Although an earlier process was discovered and used for the manufacture of sucrose esters, the esters were not approved for food use, largely because of the difficulty of removing dimethylformamide reaction solvent. This process was designed to eliminate those objections. That process has now been licensed by Dai-Ichi Kogyo Seiyaku Co., Koyoto, Japan, and the esters have been commercially produced for approximately 10 years. These sucrose esters have many applications as food additives and are being marketed in Japan and several other countries.

(*Cereal Foods World* 26(5); 1981; 246)

8 Pure powdered cellulose

A pure powdered cellulose (Grade 1 600/30/FCC) is said to be the first commercially-available to provide: Ultra-fine particle size and ease of incorporation into smooth-textured foodstuffs. It makes possible powdered formulations without the objectionable mouth-feel and grittiness of similar products in the past. The powder is especially attractive for such reduced-calorie foods as: Puddings, pie fillings, cakes and cookies, and related products.

(*Food Engineering International* 7(1/2); 1982; 69)

9 Coconut flavour

A coconut flavour in either "dry" or "liquid" form available from International Bakers' Services, Inc will impart a "fresh", "natural", coconut flavour, taste and aroma to all sweet foods, according to the company. The flavours are classified as "Natural and Artificial Flavours" and carry Kosher certification.

(*Bakers Digest* 55(3); 1981; 46)

PROCESSES

10 Extraction process for potato chips, coffee, hops

This exciting new process removes fat from potato chips - but not the flavour. Critical Fluids Systems (CFS), Inc., an ADL subsidiary, developed the process, which takes advantage of the unusual solvent properties of such liquids as carbon dioxide that are near their "critical: state. The process is deceptively simple. That is, it works because fats and oils are soluble in supercritical carbon dioxide - but proteins and carbohydrates are not. This selectivity means that it is possible to extract a portion of the fat in a potato chip without changing the chip's flavour. As much as 50% of the fat can be so removed. Since a finished potato chip is about 40% fat by weight, the process reduces total fat to about 20%. Furthermore, the chip's calorie count is likewise cut by about 20%. Protein content at about 1.5% to 2%, on the other hand, is increased slightly.

The CFS process is effective because the chips are thin, with a large surface area. Thus the surface contact with the CO₂ is considerable; and there is no damage to the chip's structure. Presently, says Ms. Caraday,

there are two commercial-scale applications of this technology. One is the Hag AG plant in Germany, where it is used for decaffeination of coffee. The other, in Australia, is for liquid CO₂ extraction of hops.

(*Food Engineering International* 6(10); 1981; 45-46)

11 Producing soy protein products

Osahiro Satou, Makoto Yamaguchi, and Mikio Hasegawa of Ajinomoto Co. Inc., Tokyo, Japan, have invented a technique for efficiently removing undesirable odours and tastes from soybeans and/or soy protein products during extraction in alcohol-water mixtures. This technique combines the known technology of ethanol extraction of off-flavour and coloured compounds from soybean protein products and a unique feature of removing the undesirable substances from ethanol and recycling it, which greatly reduces the amount ethanol needed and thus reduces cost.

Other processes for recycling ethanol after removal of undesirable compounds, which have used reduced pressure conditions, active carbon, or ion-exchange resin, have proven unsatisfactory. During repeated recirculation of the solvent, undesirable odours accumulate, and repeatedly processed organic solvent eventually imparts odours to soybean protein products. (*Cereal Foods World* 26(7); 1981; 357)

12 Improved soy protein (Isopro)

Griffith Laboratories (UK) Ltd. of Cotes Park Farm, Somercotes, Derby DE5 4NN, have developed a process for producing an improved soy protein called Isopro. This patented process yields a highly functional soya protein concentrate. The process controls permit optimum refinement of the product in terms of flavour and colour without denaturing the protein. Thus the retention of a high degree of solubility coupled with low viscosity, are assured. This gives an extremely effective binder and emulsifier applicable to a wide range of food products.

(*Food Trade Review* 51(7); 1981; 355)

13 Blanching techniques compared

Microwave-blanching vegetables (asparagus, green beans, green peas, and sweet corn) lost more flavour, nutritional content, colour, and texture and, overall, compared unfavourably to water- or steam-blanching vegetables in U.S. Department of Agriculture (USDA) tests. Vegetables are

blanched or heated before freezing to inactivate enzymes that cause spoilage, improve colour, and remove air so that more product can be placed in a package. Traditionally, hot water or steam has been used for blanching, but in recent years much interest has arisen in the use of microwave ovens for this purpose. Drake and his assistants conducted their comparison study over a two-year period. Vegetables were washed and either water-, steam-, or microwave-blanched, cooled in water, packaged in plastic pouches, and frozen. Objective quality tests were made. Then samples of each vegetable blanched by each technique were presented in four separate trials to 15 randomly selected panel members who ranked the samples for colour, texture, and taste according to personal preference.

In both the objective and the subjective tests, the microwave-blanched vegetables were found to be less acceptable than water- or steam-blanched products. No significant time was gained using microwave blanching because both water and steam blanching required only about two minutes.

Drake noted that in the present study, contrary to previous reports, little difference existed between the quality of water- and steam-blanched vegetables in either objective or subjective measurements, although water blanching might have produced a slightly more flavourful product.

(*Cereal Foods World* 26(7); 1981; 358)

14 Calcium chloride dipping of stored apples.

CaCl_2 dip is used to reduce the incidence of the physiological disorders, bitter pit and breakdown that occur during storage of apples. Apples are submerged in a solution of CaCl_2 and the pressure of the atmosphere above the solution is either decreased (vacuum infiltration) or increased (pressure infiltration). An uptake of about 1 mg Ca/100 g fruit usually provides a good level of disorder control. The treatment can also reduce the rate of flesh softening and loss of green colour of fruit during storage. The use of the techniques on Jonathan and Delicious apples would be of benefit if the problem of extremely variable uptakes of solution through the open calyx can be solved.

(*Food Technology in Australia* 32(8); 1980; 412-413)

15 Ultrasonic cleaning of beer kegs

Conventional spray washing of beer kegs gives unsatisfactory cleaning and wastes hot water and cleaning agents. The use of ultrasonic modules

improves performance but single frequency continuous generators are too costly. By using variation of amplitude the peak power ratio is doubled and better cleaning results due to cavitation effects. By varying the frequency as well as the amplitude the average-to-peak power ratio becomes 4:1 and still faster cleaning is obtained. Uniform cleaning is obtained without stratification. The ultrasonic process drives through the wall of a metal container and sets up a cleaning action inside a filled keg e.g. a heavily contaminated keg can be cleaned inside and out in 2 min.

(*Brewing and Distilling International* 11(10); 1981; 33,37)

16 Process overcomes lactose intolerance

Tetra Pak have developed the idea of adding minute amounts of lactase to milk packed in long life containers. The lactase is added to the milk in minute quantities just prior to its being packaged at the dairy. The lactase predigests the lactose in about 7-10 days, breaking it down and making it completely harmless to the lactose-intolerant consumer. The milk quality and nourishment factors are apparently not affected. The method, called Tetra Lacta, adds an insignificant amount to the milk cost, we are assured.

(*Food Trade Review* 51(3); 1981; 141)

BYPRODUCTS AND WASTE UTILIZATION

Nil

PROCESSED PRODUCTS

17 Food processing

Yomato Honey Co. Ltd., has developed an inexpensive sweetener, 'Jabee 80', by mixing fructose and honey. Fructose is now being increasingly used in place of sugar which is regarded as a major cause of obesity. The new product is made of fructose produced from starch (80%) and honey (20%). It combines the mild flavour of fructose and the distinctive fragrance of honey. The principle advantages claimed for the product are: (1) Its cost is half that of honey; (2) it is not crystalline, unlike honey; (3) its solubility, even in cold water, is high; and (4) it is a low-calorie product

and is sweeter than sugar.

(*Asia-Pacific Technology Digest* 3(4); 1982; 3)

18 Quick-cooking brown rice

Quick-cooking brown rice that can be prepared in the home in one-fourth the time of regular (raw) brown rice has been developed by scientists in Berkeley, CA. This product is more nutritious, containing 20% more protein, seven to nine times more vitamins, and two times more minerals than white rice. Brown rice is not milled as is white rice, and thus it still retains the darker bran and aleurone layers. These outer layers contain the valuable nutrients-high quality protein, vitamins, and trace minerals.

Drying time during processing is about half that required in existing commercial quick-cooking processes for white rice, and drying is at a lower temperature, according to USDA chemical engineer Robert Carlson. In addition, brown rice requires less milling, and less cooking time at home. Taste panel tests indicated that the quick-cooking brown rice is comparable to conventionally-prepared brown rice. Brown rice has a more pronounced flavour than white rice, somewhat akin to the taste difference between whole-wheat bread and white bread. Quick-cooking brown rice will be available to consumers whenever a private enterprise adopts the process, which is available without charge, and markets the product.

(*Cereal Foods World* 26(6); 1981; 304)

19 Sodium-reduced bread as flavourful as "regular" bread

White and whole wheat bread can be made with a blend of potassium and sodium chloride without loss of flavour acceptance, according to tests reported from Oregon State University, Corvallis. Untrained tasters failed to differentiate between the sodium reduced products and "regular" bread, both prepared by a local bakery. Flavour scores were slightly higher in whole wheat breads made with the 1:1 sodium : potassium blend.

(*Food Technology* 26(11); 1981; 645)

20 Fungus-based food tastes like meat

RHM, Europe's fourth largest food manufacturer, plans to have food based on a *Fusarium* fungus. Dr. Jack Edelman, RHM Research Director, says the fungus, which can reproduce itself in vast quantities when fed on

glucose-syrup and ammonia, is "delicious to eat, is nutritious and has the advantages of year-round consistency of production and quality with little or no waste". Human trials of mycoprotein have been confined. The fungus lacks certain minerals found in meat, in particular iron and zinc. Furthermore the high fibre content - around 20-25 per cent - could cause dietary minerals from other sources to be retained in the intestine. Iron and zinc can be supplemented to make up for any mineral deficiencies that mycoprotein's high fiber content would be harmful.

(*Food Engineering International* 6(9); 1981; 69-70)

21 Isolation of proteins from low-priced fish

A process is described for the preparation of odourless fish proteins from some low-priced fish var. viz: croaker (*Johnius dissumieri*), anchovy (*Trissocles* spp.) and Bombay duck (*Harodon nehereus*). The process consists of cooking whole fish in 0.3% orthophosphoric acid, separation of the meat, pressing it to a moisture content of about 50% in a screw press to remove the soluble odour compounds, and hydrolysis of the proteins from the press cake using enzyme, acid or alkali. The protein extract was further deodorized by steaming for 1 hour and then dried in an air dryer at 60 C. The powder had negligible fishy odour and high organoleptic ratings.

(*Fleischwirtschaft* 61(9); 1981; 1368-1370)

22 Uses for whey powder

Whey may be obtained in a partially hydrolyzed form from lactase-treated milk used for cheese production. Extensive test programs using conventional one or two-stage spray dryers, or combined spray/fluidized bed dryers, have had only limited success in drying hydrolyzed/whey products. In some of the successful operations, only 30% of the lactose in the whey is hydrolyzed, which considerably reduces the advantage of drying.

A non-caking, non-hygroscopic lactose powder may be prepared comparatively easily by drying the powder to 12% moisture and holding it there for a time sufficient to allow the material to crystallize as *alpha*-lactose monohydrate, which is stable to humidity. The problems presented in drying a hydrolyzed lactose product are solved by depositing the product as a semi-dry powder on a moving belt and removing it from the belt when sufficiently dry. The device used to accomplish this is the three-stage

"Filtermat" dryer manufactured by Damrow Company, Fonddu Lac, Wisconsin, USA. The use of hydrolyzed whey has typically been limited to syrups with up to 70% solids.

In some bakery products, both egg protein and sugar can be replaced by hydrolyzed-whey products - up to 30% in the case of the egg protein. Also, the sugars improve the colour of the baked product. Hydrolyzed whey can replace much of the sweetened condensed milk in toffees, fudge and candy bars. There is no graining or crystallization, and caramelization is improved. Hydrolyzed whey can replace sugar and milk in frozen yogurt desserts and ice cream while improving meltdown characteristics. There is no sandiness, even after extended storage. Hydrolyzed whey is a perfect base for such sweet and sweet/sour products as sandwich spreads, dressings and soft drinks.

(Food Engineering International 7(1/2); 1982; 55-56)

23 High-protein whey concentrate

Using ultrafiltration processing techniques, Danmark Protein AS, is producing whey-protein concentrates with protein levels far higher than in the past. In fact, protein levels of 60% to 80% are being achieved, which may lead soon to the appearance of breakfast bars and similar high-protein products on grocers' shelves.

(Food Engineering International 6(9); 1981; 11)

24 Bread from cotton seed flour

Milout Company of Haifa has introduced a flour made from cotton-seed. The bread made from this seed is said to have a nutty flavour and to have won consumer acceptance. The flour has a protein content of 60% as against 40% for soya flour.

(Asia-Pacific Technology Digest 3(3); 1982; 6)

25 Refined soya protein

UniMills has developed a bland 70% soy protein concentrate called 'Unico' by applying an alcohol/water extraction process to unrefined defatted soy flour. Off-flavour components are extracted in the alcohol phase and soluble sugars, responsible for flatulence, by the water phase. Although Unico has a low Nitrogen Solubility Index (8%) it plays a useful functional

role in binding fat and water, e.g. when added to fresh sausages. It has been shown to be effective in the replacement of skim milk in various foods where its blandness and functionality are important.

(*Food Policy* 5(1); 1980; 71-72)

26 Powder from honey and fruit juices

Kibbutz Maarbarot produces dried honey, a fine white powder which is a spraydried concentrate of molasses and honey on a base of corn syrup, glucose or malto-dextrins as a carrier. Maarbarot also produces comminuted orange, lemon, mandarin and grapefruit powders. This process involves the spray drying of the whole fruit, seed and peel and not just the juice.

(*Asia-Pacific Technology Digest* 3(3); 1982; 6)

EQUIPMENT AND MACHINERY

27 Water softner

Komal Industries manufacture an equipment that softens water by removing the scale forming ions of calcium and magnesium and replacing them with an equivalent amount of sodium ions. This process finds applications in the preparation of water for boiler, laundry, dye house and textile mills, as well as chilling and ice making plants, heat exchangers, etc. The softener is available in 600 to 9,500 L/hr. capacities.

(*Industrial Products Finder* 10(12); 1982; 44)

28 Packaged nitrate removal plant

Chiltern Water Treatment has launched a range of packaged nitrate removal units. Based on the ion exchange technique and utilizing the hardware of the Chiltern base exchange water softener range, the nitrates are removed from the water supply by the action of a special anion exchange resin. Canneries and factories already operating base exchange softeners will find the nitrate removal units easy to integrate with existing softening plant, say Chiltern. The range covers flow rates from 50 litres per hr up to 8000 litres per hr and will remove nitrate down to a level of between 5-10 mg per litre.

(*Food Trade Review* 51(3); 1981; 133)

29 Liquid & semi-solid filler

The Panchal Workshop offer their Piston Filler for handling a variety of liquid, semi-liquid and semi-solid materials - mango ras, jam, juice, shrikhand, cheese, ghee, syrup, tomato ketchup, oil, viscous chemical, paint, snow, cream, shampoo, etc. Quantities of 50 ml to 1,000 ml and 1,000 ml to 5,000 ml can be filled at the rate of 2 to 15 fills, a minute. The machine has speed and quantity adjustment facility. The capacity of the SS hopper is 50 l. All parts in contact with the material are in SS. In this semiautomatic machine, containers are handled by the operator for filling and removing. The rest of the operations is automatic. The machine is air-operated.

(Industrial Products Finder 10(12); 1982; 79)

30 High-efficiency wine centrifuge

Bell Bryant announce the availability of the new Westfalia SCA 160 high-efficiency centrifuge for the clarification of musts and wines to a high degree of clarity. The centrifuge operates at a bowl speed of 6800 rpm and develops a g-number of 15,000 compared to 5000-8000 developed by conventional centrifuges. The capacity of the CSA 160 centrifuge is 6700-15600 L/h depending on the type and pretreatment of the wine. At the high g-number developed, the CSA 160 removes all yeast cells and 90-95% of the lactic acid bacteria present and can replace filters in almost all wine clarification processes.

(Food Technology in Australia 33(6); 1981; 262)

31 Dust extraction's new units

Dust Extraction (International) Ltd. of Wellington Engineering Works, 67 Wellington Street, Leeds LS3 1LG, have announced the development of a new range of dust extraction units to complement their existing series. The new units are to be known as the MP Series and comprise a complete range of automatically shaken filter units of the pad-type. The MP Series is available in sizes from 10 sq.m. up to 40 sq.m. filter area and retains the existing range of highly efficient fan units designed to give optimum performance under all conditions.

(Food Trade Review 51(3); 1981; 133)

32 Flexible conveyor

Spiroflow is a flexible conveyor consisting of polyamide outer tube, spring steel (or stainless steel) spiral and an electric motor. It is designed to handle powders/granules (even certain viscous liquids), e.g. animal feeds, cement, chemicals, coffee, detergents, fertilizer, flour, milk powder, plastic granules, sand, seeds, spices, sugar or tea. The equipment is completely mechanical (uses no air) totally enclosed, dust free in operation and easy to clean. The material is fed by a horizontal inlet beneath a hopper or a probe inlet which rests directly in a container or drum. The spiral is directly coupled to a fixed or variable speed electric motor rotating at 1,420 rpm. The material is drawn up the tube and discharged at the outlet end. The throughput rate varies depending on the size of Spiroflow used, bulk density of the material and flow characteristics. Two or more units may be coupled together. There is no degradation or separation: in fact, the mixture undergoes thorough mixing. Various models are available in diameters ranging from 37 to 90 mm. The Spiroflow is manufactured in India to the designs of Spiroflow (UK) Machinery Ltd. (PFNDAI Newsletter No. 29; 1982; 2-3)

33 System screens granular materials

The Geological and Mining Research Bureau have added to their range of screening equipment the Panneau Super Tamiseur 2000, which can treat several hundred m³/h of pulp and up to 80 t/h of granular or crumbly materials. The inclusion of reverse spraying increases treatment potential, in particular reducing the risk of clogging. The device is suitable for applications in ore processing, purification of industrial sludge, food processing industries, etc.

(Industrial Products Finder 10(12); 1982; 93)

34 Heat exchanger prevents clogging and contamination

Energy cooling systems have introduced an intermediate heat exchanger module for fitting to the Alfa-laval packaged chiller where acids or other aggressive liquids are to be cooled to low temperatures. Aggressive liquids must not be circulated through the primary cooling circuit of the basic chiller, manufactured from corrosion-free materials, where the liquid contains mud or other solids the heat exchanger prevents clogging of evaporator

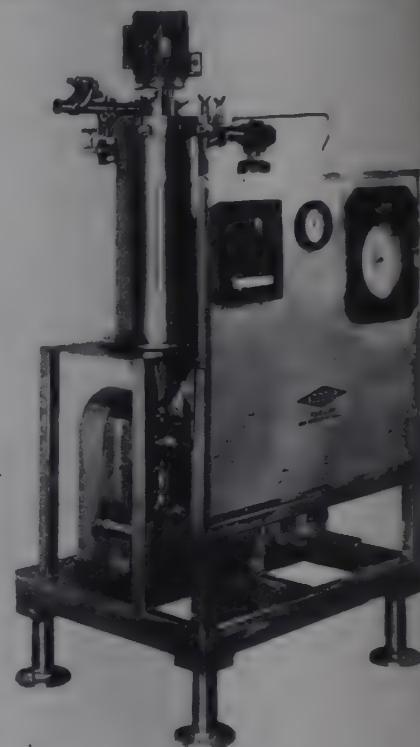
and pump passages which are not easily stripped down. The heat exchanger can also act as a precooler to ensure that the evaporator inlet temperature does not exceed the recommended 35 C.

(*Food Manufacture* 56(12); 1981; 59)

35 Continuous heat exchanger

The Model RH Calefactor may be used for such processes as gelatinizing starch slurries; inactivating enzymes in pureed fruits and vegetables; and cooking starch puddings, tomato pastes, table sauces, cereals, meats, and similar products. Designed for use in continuous lines, the Calefactor introduces the product into a relatively quiet-steam atmosphere, eliminating local hot-spots caused by high velocity or super-heated steam. This produces a more uniform and thoroughly cooked product of even texture. It also improves the flavour and colour retention of the product.

(*Food Technology* 35(6); 1981; 91)



36 Free flowing heat exchanger cuts out clogs

Nowadays the objective in fruit juice production is to provide a product that is as near as commercially possible in taste and consistency to freshly squeezed fruit juice. There are considerable problems with orange, grapefruit and particularly pineapple when large amounts of sediment or fibrous material are naturally present. Gea Ahlborn now produces a heat exchanger which can reduce the frequency of routine dismantling and wash-down to once every six weeks from the more usual interval of two days which is normally required by conventional systems.

The Ahlborn heat exchanger pack is designed with a flow gap which provides an unimpeded but highly turbulent and efficient fluid passageway between the plates which damages or retains little cellular material.

(*Process Engineering* 62 (10); 1981; 25)

37 Automatic food sorter

An automatic food sorting machine from Britain should prove useful to food packers and processors. It is designed to handle wet, fresh or frozen food products. It incorporates an optical system to identify differences in surface colour which could denote a poor quality item.

The Sortex 1583, which conforms to all relevant international regulations for the food and agricultural industries, is easy to operate. An entire bank of machines, once set to perform a particular task, can be monitored by a single unskilled operator. LED indicators show at a glance any deviation from normal, and solid state electronic circuitry ensures reliability and low maintenance requirements.

Products ranging in size from small cocktail onions and diced vegetables to french fried potatoes are individually inspected by sensors which detect rejects and pass electronic signals to an ejector bank. High speed valves then release jets of air to deflect unacceptable items away from the main stream. Throughput is 4000 kg/h and the machine can be run continuously for 24-hour periods.

An automatic washing system keeps the viewing zone free from food particles and other contaminants and all parts in contact with food are of stainless steel. Typical water consumption is 2 litre/min.

(Food Technology in New Zealand 17(1); 1982; 33)



This automatic food sorting machine, Sortex 1583, is designed to handle wet, fresh or frozen products ranging in size from small cocktail onions to fresh fried potatoes.

38 Sorts rice by colour

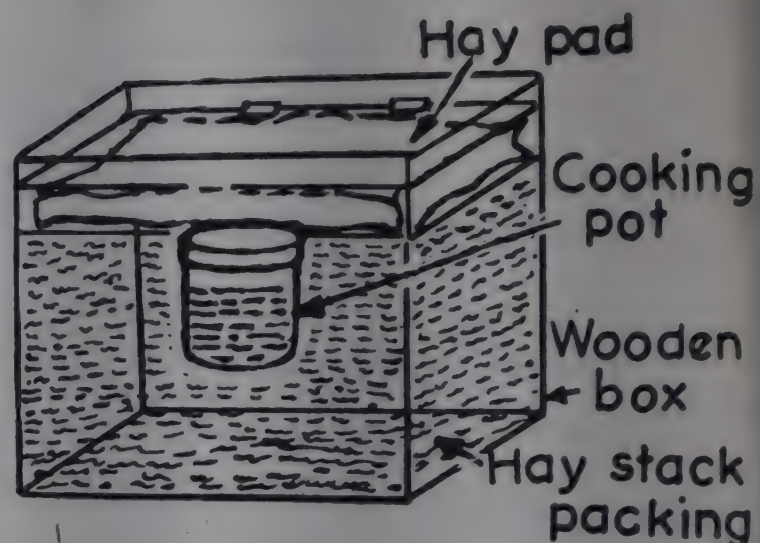
Gunson's Sortex Ltd. have introduced a fully automatic electrooptical machine with 40 channels for sorting rice. A typical input of parboiled American rice with 2.5% peck-discoloured grains or impurities - is upgraded to 0.124% with minimum good product presentation in the reject stream. In this example throughputs of 2000 kg are achieved. The only operator controls are sensitivity and feed rate.

(Food Manufacture 56(12); 1981; 59)

39 Energy saving cooking box

In these days of energy shortage even a small bit of energy saved amounts to energy produced. Here is a simple and cheap cooking box which saves up to 20% LPG/kerosene fuel without using the costly pressure cooker. It can be fabricated by any householder with ordinary skill.

As shown in the diagram, a deal/country wood box of 46 x 46 x 40 cm size is filled with paddy haystack leaving a central hole of 18 cm diameter to accommodate an average size cooking pot. The haystack should be packed



The energy saving box with a cooking pot and covered with hay pad.

tightly to provide effective insulation to the cooking pot, with 12 cm at the top left unfilled to accommodate a cloth sac (40x35 cm) tightly filled with hay.

The pot containing water and cooking materials is covered with a plate and heated as usual on the stove to boiling point and then transferred to the cooking box which is closed after the hay-sac is placed in position. The meal is slowly cooked by the thermal energy stored in the boiled water. Rice can be cooked within 30-40 minutes. A cooking box fabricated from a used deal-wood packing box filled with haystack and topped with a plain hardboard cover has enabled the author to get 12% saving in LPG fuel.

(*Invention Intelligence* 17(5); 1982; 205)

40 Solar cooker using coatings for enhanced solar thermal energy conversion (CESTEC).

The cooker is based on the utilisation of coatings for enhanced solar thermal energy conversion (CESTEC). This coating absorbs maximum fraction of the solar radiation and emit very little by reradiation and hence its temperature raises to 80-120 C above the ambient and hence the food material is cooked in a shorter time in comparison to the cooker using black paint.

(*Indian Energy Abstracts* 1(3); 1982; 10)

41 Solar food dryer

The United Mission to Nepal has developed a culturally acceptable, economically attractive, efficient and safe solar food dryer for use in rural Bangladesh. The dryer is constructed of panels made from a 5 cm thick sandwich of woven bamboo sheet and rice straw. The internal surface of the dryer are coated with a mixture of resinous tree gum and powdered charcoal. Woven split bamboo can is used to make the removable food trays. The open top is covered with a sheet of 6 micron thick low-density polyethylene film, which costs 5% the price of sheet glass in Bangladesh. The drying of fruits and vegetables takes from 6 hours to 2½ days depending on the initial water content and product thickness.

(*Asia-Pacific Technology Digest* 3(3); 1982; 3)

42 Build a backyard solar food dryer

If you love the tangy, sweet taste of dried apricots and peaches, or enjoy the spicy flavour of dried peppers and onions, a backyard solar food dryer may be just the thing for you. For less than \$20, you can build this energy-efficient device. All you need for the project are simple hand-tools-hammer, drill, pliers, clamps and handsaw, inexpensive materials-string, aluminium foil, glue and wood for the frame; and a little bit of do-it-yourself ingenuity. Free, detailed instructions are available from the US Citrus and Subtropical Products Laboratory in Winter Haven, FL, where SEA researchers designed, built and tested the dryer as part of a cooperative effort with the Department of Energy. The unique feature of the dryer is a low-cost, curved focusing surface that concentrates radiation from the sun just enough to dry foods but not enough to cause them to over-heat or burn. The focusing surface is made from ordinary household aluminium foil drawn over strings held taut by a framework of laminated wood curves or parabolas. These parabolas are glued into a frame work designed to support the dryer at an angle that best catches the sun's rays. The dryer focuses 1.4 m² of insolation-incoming solar radiation - onto 0.48² of drying surface.

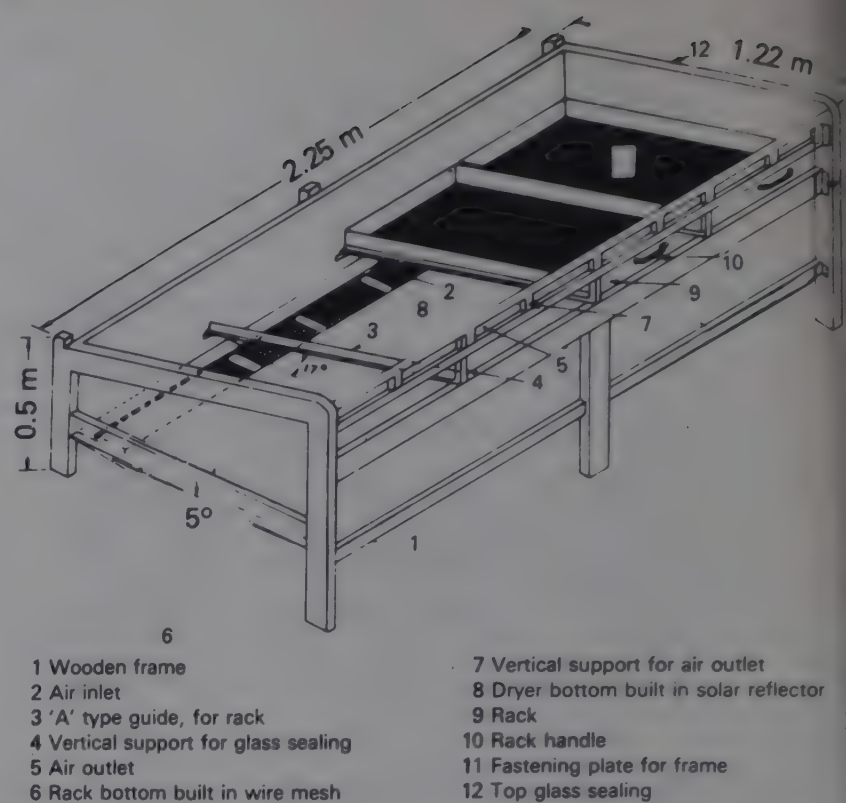
The dryer is covered with polyethylene (clear plastic) with slit openings arranged at the top and bottom to allow controlled air to flow upward from the base, through a perforated aluminium shelf on which the food is dried, and then out the top. This plastic covering protects the food from dust, birds, insects, rain, and prevents the re-entry of moisture.

(*Agricultural Research* 29(10); 1981; 10)

43 Solar cabinet for chilli drying

The Central Institute of Agricultural Engineering has designed a low-cost solar cabinet which rapidly dries chillies, an important cash crop in India. The dryer performs well in comparison with sun-drying on other surfaces such as tarpaulin (olive green), black polyethylene, cement concrete floor and mud floor.

In performance tests, the most rapid drying rate was achieved by the solar cabinet. Tests are still being carried out to improve the dryer's efficiency. (*Appropriate Technology* 8(4); 1982; 3)



44 Multi-use drier

A low-cost portable, collapsible copra drier intended for small scale coconut farmers has been developed. It can also be used for drying coffee, corn, peanuts and rice. With slight modifications it can also dry fish and cassava. Made from indigenous materials it utilizes charcoal derived from the waste coconut husks, thus saving the expense of purchasing fuel. (*Cardamom* 14(11); 1982; 19-20)

45 Solar drier for cigar grade tobacco and vegetables

Exposure to proper heat treatment by this drier, ensures optimum moisture, proper flavour and flat lustrous shape to tobacco leaves. Chillies, Clusterbeans, Gobhi, etc., are dried for picklings and sugarcane juice can be fermented for vinegar. The farmer will readily accept it because of its virtues in terms of cost, easy fabrication and almost nil maintenance charges.

(*Indian Energy Abstracts* 1(3); 1982; 9)

46 Cheap solar cooker

A cheap solar cooker to cater to a family of four has been developed by a retired veterinary college lecturer. It can cook food in one and a half hours. Housed in a small suitcase with mirrors, burners and a built-in thermometer, it would cost Rs. 400, but would be sold to the farmers of Bhor and Sinnar-in Maharashtra with a subsidy granted by the alternative energy source commission, Mr. Gadre said.

(Times of India, February 21, 1983; 13)

47 Offset feed paraboloidal solar stove for indoor cooking applications.

Solar cookers made of paraboloidal reflectors have not become popular because of their outdoor usage. A new stove employing offset feed reflector with altogether new mount is conceived for indoor cooking applications. A crude model with ordinary 3 mm Al sheet reflector gave an output of 490 W/1.4 sqm. By utilising high reflectivity sheet and better absorber higher power outputs are expected.

(Indian Energy Abstracts 1(3); 1982; 11)

48 Solar wood stove

A wood stove manufacturer has just introduced a unique combination stove and solar panel water heating system for the US domestic market. The Lin-Thompson Co., has combined its vertical draft wood stoves with Radco solar panels to heat 50 or 82 gallon water tanks. The system is microprocessor controlled and activated by room and water temperature sensors that operate the stove flue and three Grundfos water pumps. The 68,000-85,000 BTU/hr stove heats an externally mounted copper pipe boiler to feed a DHW storage tank. The tank is also connected to a set of two glycol-filled solar panels, which feed a counter-flow, three-walled exchanger. The panel system, the heat exchanger and the stove boiler are all separately pumped. When the stove boiler or solar panel temperature, reaches a value 16 F above storage tank temperature, the microprocessor triggers a pump to circulate water until the solar panel or boiler temperature is within 5 F of the storage tank temperature. A safety valve vents pressures above 145 psi.

(Asia-Pacific Technology Digest 3(4); 1982; 7)

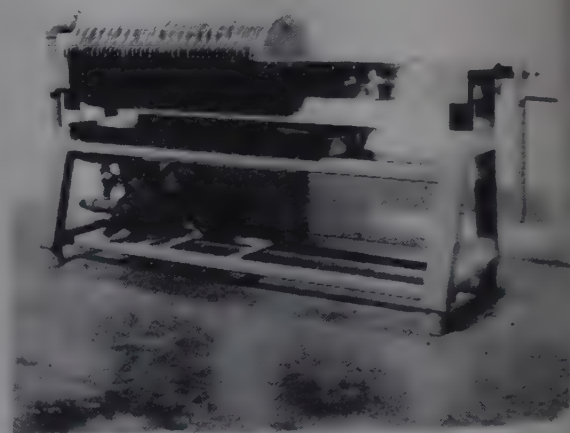
49 Biscuit oven uses radiant heating

Luminous wall panels with a surface temperature of 1000 C and a recirculatory forced air convection system are used in a new oven for biscuit-making from Simon-Vicars Ltd. The wall panels cover the width of the baking chamber below the conveyor to give a fast, even rate of heat transfer to the product mesh conveyor. Two more panels at the oven exit, above the conveyor, impart the final colour and surface texture. The system is said to allow products to cool far more quickly than with previous methods without cracking or checking.

(*Food Manufacture* 56(12); 1981; 59)

50 Filtration for frying oils

Star system offers a unit fabricated for the filtration of hot frying oils. This sturdy, reliable, stainless steel plate & frame filter is said to prevent the formation of free fatty acids. Used continuously during the frying operation, oil is not wasted by rancidity. When frying with this filter, oil is reported to provide results that include less oil absorption in fried products, a more attractive appearance improved taste and prolonged shelf life. The unit is 40 disc 18"



(450 mm) diameter, 1½" (36.5 mm) wide and built on an expandable, 87" (2209 mm) long stand. Machine also handles 1200-5000 lbs (540 kg - 2250 kg) of finished product an hour. This corrosion-resistant unit allows filtered oils to be drawn off in order to check colour, aroma, etc. This handy valve also allows oil in the machine to be emptied into a stainless steel drain pan before cleaning/redressing the machine. (*Food Engineering International* 7(5); 1982; 72)

PACKAGING

51 Bread packed in cans

These new bread specialities are sliced and vacuum-packed in metal cans that are easily opened; and they guarantee freshness for two years on the shelf. The 250-gram cans are especially handy for such uses as camping,

outdoor entertaining and the like. There are several types: Black bread from Westfalia("Pumpernickel"); and a wheat and rye-flour country bread ("Bauernbrot"). The latter is fermented with germ and has a touch of salt - but there are no additives or preservatives.

(*Food Engineering International* 6(9); 1981; 11)

52 Tea packs stretchwrapped

J. Lyons & Co. (Ireland) are probably the first company in Europe to commence stretch wrapping palletised retail food packs, in this case mostly 1 lb packs of tea overwrapped into sixes. The wrap stabilises the load comprising 180.6 lb packs of tea, and over 6 ft. in height, protects the contents and has helped handling thereby achieving a quicker turn round of the company's transporters. Timperley Engineering's Rotarap L2000 wrapper is installed at Lyons' Dublin plant.

(*Food Trade Review* 51(3); 1981; 145)

53 Wine in tins?

Coca-Cola Co is experimenting with wines packaged in aluminium tins like soft drinks. The tinned wines are being sold to passengers on United Airlines flights in the western United States. American airlines have been desperately seeking ways to cut overall aircraft weight to conserve on costly fuel. A case of 486.3 oz tins of wine weighs only 22.6 lb, less than half the 48 lb weight of the same amount of wine in glass bottles. The wine in tins take up half the space of glass bottles and they cost less, because they eliminate the expense of labels and corks.

(*Food Technology in New Zealand* 16(2); 1981; 21)

54 New perforated films introduced

Perforated polypropylene films are being introduced by T.&R. Graham Ltd. of Paisley, Scotland. Perforated film helps disperse moisture build up, which can soften breads and morning goods and ensures that the product still looks attractive in chill cabinets. The standard perforation being offered by the company is 80 perforations' per square inch. Printed material can be supplied up to a width of 1000 mm and in six colours by the flexographic printing method. The company's method of perforation allows unperforated areas to be left in the machine direction. This means that the back sealing

areas can be left clear of perforations for easier running on horizontal form fill and seal packaging machinery. At the same time, parts of the design can be left clear where perforating could disfigure the printed area. (*Food Trade Review* 51(3); 1981; 143)

55 Special bags for bulk packaging

With the cooperation of Schupbach of Switzerland, Babri packagings has now developed a flexible bag capable of holding bulk quantities of products like cashewnuts, and fruit pulp under vacuum and nitrogen flushed conditions. These bags are manufactured from a laminate of polyester/foil/polyester/polyethylene. The poly-star vacuum and gas flush packaging machine is recommended for packaging these bags. (*PFNDAI Newsletter* No.34; 1982; 1)

56 DRG packaging bags announces thermovac

A new concept in protective packaging for food products has been announced by DRG Packaging Bags of Bristol. Developed in close collaboration with Lyons Tetley Ltd., the new pack is a fully heat sealed, free standing, box-shaped bag comprising an outer wall of blade coated kraft and a lining of high vacuum metallised polyester/polyethylene laminate. In use, the special interply structure of the bag allows the protective inner liner to be drawn around the contents under vacuum without distorting the outer paper wall, thus maintaining the bag's shape and shelf appeal.

Lyons Tetley are using the new concept to launch their range of Continental Blend, Brazilian and Kenyan coffee beans.

The designs are printed six colour photogravure and carry an EAN symbol on the base of the bag.

(*Food Trade Review* 51(7); 1981; 365)



Lyons coffee packed in Thermovac

57 Standard glass jars found safe for use in microwave ovens

Conventional glass jars have been found safe for use in microwave ovens, according to tests conducted for Indian Head Inc. The major research study was conducted by John Gerling of Gerling Laboratories, a noted expert in microwave technology. Key among his findings were:

Standard jar glass is transparent to microwave energy, easily permitting its contents to be heated in a microwave oven. If a lid is inadvertently left on the jar as it is being heated, any significant pressure buildup will be vented between the lid and jar. No explosion results even if the jar is imperfect. Various types of labels can be used on the jars and left in place during microwave heating, and foamed polystyrene labels will allow a jar with heated contents to be handled without a potholder. A glass jar used in a microwave heating application can be reclosed and reused in the microwave oven as often as necessary.

In concluding the study, Mr. Gerling stated, "Glass is perhaps the only competitively priced material suitable for use as a packaging material which is both capable of being retorted and is microwave transparent.

(Food Production Management 103(12); 1981; 12-13)

58 Stag packaging machine

Ilapak started developing the Stag machine in 1980. Although designed for bakeries, the machine is equally well suited to the produce industry. It is a vertical machine, using centre folded material, and is capable of operating at up to 30 packs per minute. The operator places the product through a safety door into the centre-folded film and closes the door. This activates the machine, so that material is drawn down and a seal is formed vertically and horizontally. The formed bag containing the products is supported by clamps which only release it at the next machine cycle. The packs can either be collected in a container underneath the machine, or else a conveyor can be supplied to take the finished packs away. The whole sealing operation is controlled by microprocessor and the machine is mechanically driven. The stag can handle most known types of heatsealable material.

(Food Trade Review 51(10); 1981; 575)

ANALYSIS

59 Kjeldahl Protein/nitrogen analyses

Kjeldahl digests may be accomplished automatically using the Kjeltec Auto 1030 Analyzer. The analyzer features a microprocessor which automatically controls dispensing of reagents, titration, calculation, and presentation of the result. The total analysis time is about 2 min. and the result, in % protein, % nitrogen, or ml titrant, is presented on the digital display or on an optional printer. By preselecting the program, the analyzer can be used for macro or semi-micro Kjeldahl. It can also perform a complete protein measurement on raw materials in less than 5 min including sample preparation using the Ronald's DD method. (*Food Technology* 35(6); 1981; 88)



60 New electronic grain moisture test

The Inspection and Methods Research Branch of the Federal Grain Inspection Services (FGIS) has estimated that work time in grain moisture analysis can be reduced by 50% or more for single and two-day oven drying methods by using a Dedicated Gravimetric Electronic Data System (FGIS). The system uses an electronic analytical balance with digital display and binary coded decimal output in a programmable calculator. The auto balance feeds the computer weights of dishes containing a sample before and after drying, while a technician feeds in tare weights and the file number and number of samples to be analyzed. All calculations are performed immediately when the percent moisture is printed out. Because no manual calculations are necessary, reading and transcription errors are eliminated. The reduced sample exposure time during weighing also helps to enhance accuracy. (*Food Technology* 26(11); 1981; 639)

61 Manufacture of the purest grade of water

At present there is an increasing need for very pure water in all laboratories. Only small quantities of such water are required for an investigation in most cases. To meet this demand, Gelman has now developed the WATER-1 system: a small and handy device, which can be comfortably fixed on any laboratory table. It hardly requires more space than a DIN-A4 sheet of paper. On feeding previously desalinated water, it supplies a maximum of 0.5 l of 18-Meghom water. The incorporated microcomputer checks the degree of purity continuously and indicates it in digital figures.

All purification functions are carried out by a new type of single, multifunctional capsule (casing). It contains activated carbon for the removal of organic impurities, a mixed bed ion exchange and a 0.2 μ m membrane filler for the removal of particles and bacteria. The water is taken out directly from the capsule, so that it always has the highest degree of purity. In W. Germany, WATER-1 system is marketed by 'Flow Laboratories', which can give further information.

(Riechstoffe Aromen. Kosmetika 32(4); 1982; 102)

62 Metal detector of pipelines

Loma Engineering Ltd. of Invincible Road, Farnborough Industrial Estate, Farnborough, Hants GU14 7QR, have introduced a stainless steel metal detector for process pipelines.

Developed from the successful sausage stuffer detector, the new system combines proved techniques and equipment. A miniaturised potted stainless steel detector readily fits into confined pipeline layouts and detects particles of metal of less than 1 mm in overall size to provide product and plant protection in liquids, slurry paste and emulsion processing.

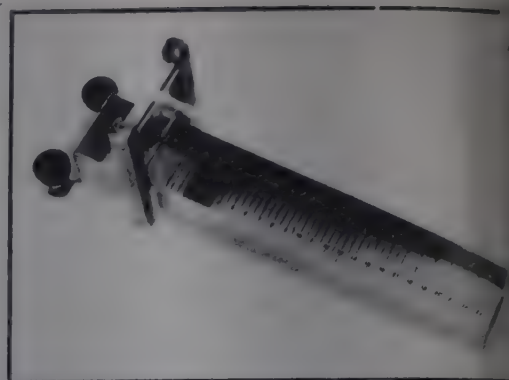
With continuously pumped pipe circuits, the reject valve allows the processor to affect metal detection and rejection without stopping the pumping process, the rejection of metal contamination being automatic, clean and effective. The detector, product pipe and reject valve have all been designed for hoseproof sanitary processing conditions and can be either dismantled by hand in minutes for cleaning or cleaned-in-place.

(Food Trade Review 51(2); 1981; 78)

63 Consistometer

This may be used to determine the consistency of jams, jellies, tomato paste, baby foods, yogurt, pie fillings, condensed soups, and other highly viscous products. Made of stainless steel, the instrument determines sample consistency by measuring the distance which a material flows under its own weight during a given time interval. Its gate is spring operated and held by a positive release mechanism permitting instantaneous flow of sample.

The trough is graduated in 0.5 cm divisions to permit accurate measurement of flow. The unit measures 14 in. x 3½ in. x 5½ in. and weighs 1.7 lb. (*Food Technology* 35(6); 1981; 90)



64 Aflatoxin meter

Aflatoxin can be detected by a simple extraction and fluorescence test using the Velasco Flurotoxin Meter available from Neotec Corp. The Velasco Flurotoxin Meter, originally developed by James Velasco at the USDA, detects aflatoxin to one part per billion in corn and nuts. No skill or training is required; answers are given in recordable numerical values. The meter is used in conjunction with the Velasco Microcolumn method. (*Food Technology* 26(11); 1981; 651-652)

65 New dew point meter

John Morris Scientific Pty Ltd. announce the availability of the Protimeter Dew Point Meter (pictured), one of the few comparatively inexpensive and portable moisture measuring instruments which is claimed to give reliable results at high humidities. The sensor may be buried in the material or if it is a liquid it is put in a special cell with the sensor, and the result is displayed on the instrument dial in 15-30 min. Moisture contents may be found by reference to tables. The instrument has recently received favourable reports in the monitoring of coffee drying in Nairobi. (*Food Technology in Australia* 33(8); 1981; 361)

6 New trace metal analyser

Townson & Mercer advise of the availability of the Mitsubishi Trace Metal Analyser Model AS-01, a semi-automatic system using differential pulse anodic stripping voltammetry (DPASV) with a hanging drop mercury electrode as the working electrode. Trace heavy metals may be determined rapidly and accurately by pushing the start switch of the instrument. Metals such as copper, lead, cadmium, zinc are measured simultaneously within the range 0.1 μ g/L - 10 mg/L. Excellent results are reported to be obtained even in the presence of complex sample matrices.

(*Food Technology in Australia* 33(7); 1981; 313)

67 Titrator determines moisture

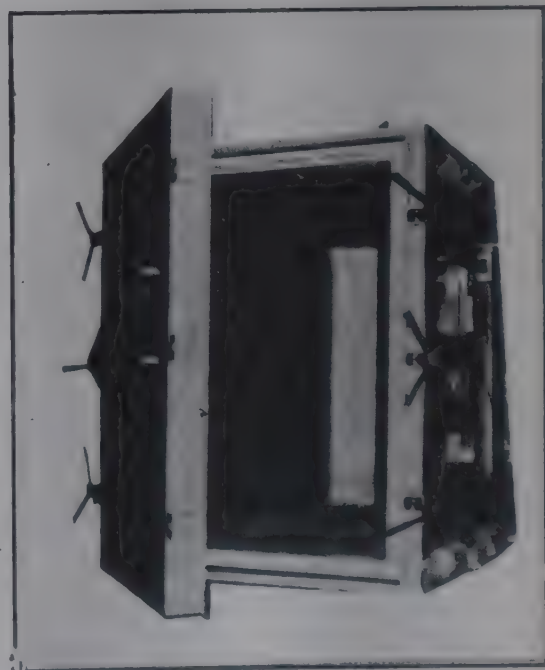
Baird and Tatlock can offer the Karl Fischer AF3 titrator homogeniser for the determination of moisture content in solid samples including food, dairy products, and tablets. A high-speed blending/homogenising system with a large darinable titration vessel is incorporated into the standard AF3 metering format. Stainless steel blades rotate at 6000 rev/min. to reduce the sample, encouraging rapid absorption of the total moisture into the solvent.

(*Food Manufacture* 56(12); 1981; 61)

68 Gas sterilization unit

Modular gas sterilization unit for use in sterilizing foods, features a modular design so that the capacity of the sterilizer may be increased more easily. The units have fully automatic controls, and microprocessor-based data logging quality and process controls are available. The units have standard cross section dimensions of 4 ft. 6 in. in width and 6 ft 7 in. in height. Lengths vary with capacity requirements.

(*Food Technology* 35(6); 1981; 91)



COMMERCIAL INTELLIGENCE

PRODUCTION (RAW MATERIAL)

All India final estimate of food grain production (1981-82)

Directorate of Economics and Statistics, Ministry of Agriculture,
Government of India

State	(Production in thousand tonnes)							
	Rice	Jowar	Bajra	Maize	Ragi	Small millets	Wheat	Barley
Andhra Pradesh	7861.5	1263.4	444.2	628.3	291.5	367.5	9.9	-
Assam	2243.4	-	-	11.6	-	4.1	115.6	-
Bihar	4260.9	6.9	6.8	732.6	94.3	52.5	2568.8	88.5
Gujarat	736.7	564.3	1473.2	396.2	48.7	109.4	1407.3	3.3
Haryana	1250.0	32.0	496.0	78.0	-	-	3682.0	158.0
Himachal Pradesh	95.6	0.2	-	459.9	7.8	9.1	430.0	40.6
Jammu & Kashmir	550.7	0.2	8.5	461.3	-	10.0	204.3	7.2
Karnataka	2207.1	1318.0	201.4	430.7	1440.1	161.6	230.4	-
Kerala	1246.9=	0.9	-	-	1.1	1.5	-	-
Madhya Pradesh	3798.5	1920.7	79.7	756.8	5.3	327.2	3274.3	173.6
Maharashtra	2435.4	4891.1	778.6	125.5	228.0	78.5	988.5	6.7
Manipur	253.1	-	-	9.2	-	-	-	-
Meghalaya	126.1	-	-	15.3	-	2.7	4.1	-
Nagaland	99.2	-	-	12.4	-	-	-	-
Orissa	4692.0	33.6	3.8	168.7	250.6	125.6	118.4	-
Punjab	3755.0	1.9	60.0	623.0	-	-	8553.0	174.0
Rajasthan	138.8	407.7	803.2	746.8	-	7.6	2942.4	582.8
Tamil Nadu	5578.0	538.9	283.5	29.0	382.3	200.1	0.5	0.3
Tripura	350.1	-	-	-	-	-	8.1	-
Uttar Pradesh	5726.0	585.6	658.0	984.0	149.6	217.4	12883.3	748.1
West Bengal	5852.6	0.3	0.8	58.3	9.7	7.4	302.0	26.1
Andaman & Nicobar Islands	21.6	-	-	-	-	-	-	-
Arunachal Pradesh	94.2	-	-	25.9	-	15.8	4.0	-
Dadra & Nagar Haveli	17.6	0.5	-	-	3.6	0.5	0.2	-
Delhi	1.6	4.2	13.1	-	-	-	106.0	2.4
Goa, Daman, Diu	113.6	-	0.5	-	9.3	-	-	-
Mizoram	28.3	-	-	6.2	-	-	-	-
Pondicherry	78.7	0.1	5.6	-	4.5	0.1	-	-

(Directorate of Economics and Statistics, Ministry of Agriculture,
Government of India)

Government of India)

(Production - in thousand tonnes)

State	Gram	Tur	Black gram	Green gram	Horse gram	Moth bean	Lentil	Lathyrus	Pea	Other pulses
Andhra Pradesh	13.6	60.3	85.7	223.6	66.3	-	-	-	-	5.8
Assam	1.5	5.2	-	-	-	-	-	-	-	-
Bihar	140.6	91.0	59.1	4.8	37.0	-	-	-	-	9.4
Gujarat	69.8	180.3	-	-	-	-	-	-	-	-
Haryana	309.0	3.7	6.2	4.9	-	1.2	11.5	--	5.5	0.5
Himachal Pradesh	1.4	0.3	3.4	-	0.7	-	-	-	-	7.8
Jammu & Kashmir	0.7	-	8.2	4.7	0.8	12.2	-	-	-	2.2
Karnataka	74.0	194.0	26.9	60.0	214.9	-	-	-	-	28.8
Kerala	-	0.8	2.1	1.5	10.9	-	-	-	-	1.2
Madhya Pradesh	1280.0	497.1	190.6	-	53.4	-	106.5	161.2	28.8	3.1
Maharashtra	176.9	427.1	149.8	143.3	62.9	34.8	4.7	21.1	3.2	15.3
Manipur	0.1	-	-	-	-	-	-	-	-	-
Meghalaya	0.1	0.6	-	-	-	-	-	-	-	-
Nagaland	-	-	-	-	-	-	-	-	-	-
Orissa	21.6	52.1	70.4	42.3	0.7	-	-	-	-	22.9
Punjab	115.0	9.5	7.1	16.7	-	0.4	-	-	-	0.1
Rajasthan	1246.2	11.5	53.9	25.5	-	146.5	10.6	-	6.6	19.0
Tamil Nadu	9.2	51.0	78.3	37.3	35.2	-	-	-	-	8.4
Tripura	0.1	0.2	0.3	0.2	-	-	0.2	-	0.2	0.3
Uttar Pradesh	1063.7	632.4	77.7	54.6	-	0.5	208.7	-	230.6	-
West Bengal	42.9	21.3	69.2	16.1	1.4	0.3	30.3	49.5	1.3	3.2
Andaman & Nicobar Islands	-	-	-	-	-	-	-	-	-	-
Arunachal Pradesh	-	-	-	-	-	-	-	-	-	-
Dadra, Nagar Haveli	-	1.3	-	-	-	-	-	-	-	-
Delhi	1.0	-	-	-	-	-	-	-	-	-
Goa, Daman, Diu	-	-	-	-	-	-	-	-	-	-
Mizoram	-	-	-	-	-	-	-	-	-	-
Pondicherry	-	-	2.6	1.1	-	-	-	-	-	-
All India Total	4567.4	2239.7	891.5	436.6	484.2	195.9	372.5	231.8	276.2	128.0

71 Estimates of milk powder

(Thousand tonnes)

<u>State</u>	<u>1979-80</u>
Andhra Pradesh	1,802.00*
Arunachal Pradesh	30.00
Assam	460.00
Bihar	1,860.00
Chandigarh	30.40
Gujarat	2,115.00
Haryana	1,950.00
Himachal Pradesh	304.00
Jammu & Kashmir	235.00
Karnataka	1,375.00
Kerala	854.00
Madhya Pradesh	2,210.00
Maharashtra	1,506.00
Manipur	58.00
Meghalaya	54.00
Nagaland	3.25
Orissa	238.00
Punjab	3,059.00
Rajasthan	3,085.00**
Sikkim	1.42
Tamil Nadu	1,860.00
Tripura	15.50
Uttar Pradesh	5,665.00
West Bengal	1,231.00
Other Union Territories	202.60
TOTAL	30,204.17

* Provisional. ** Not based on sample surveys.

(PFNDAI Newsletter No. 30; 1982; 3)

EXPORT

72 Exports of cassia from India

Year	Quantity (M. Tons)	Value ('000 Rs.)
1979-80	957.2	4873.03
1980-81	695.65	5715.44
1981-82	567.55	7290.01

(Spices Newsletter 16(11); 1982; 4)

73 Exports of tejpat from India

Year	Quantity (M. Tons)	Value ('000 Rs.)
1979-80	1269.2	1284.2
1980-81	224.96	474.10
1981-82	87.46	258.69

(Spices Newsletter 16(11); 1982; 4)

74 Curry powder

Curry powder is classified as hot and mild depending upon the relative percentage of mild spices (like cinnamon, cassia, nutmeg, mace, etc) or hot spices (like red chillies, pepper, etc.)

Exports of curry powder from India

Year	Quantity (M.Tons)	Value ('000 Rs.)
1979-80	2,644.3	25,563.40
1980-81	2,239.0	20,018.07
1981-82	1,805.0	20,018.07

World trade in curry powder is around 4,000 tonnes. 60% of this powder is hot variety and 40% is mild variety. India accounts for more than 60% of the world trade. Indian curry powder is generally classified as hot variety. India exports roughly 80% of its total production in the country, to more than 65 countries of the world. The European countries prefer a mild type of curry powder; and the Middle East countries prefer the hot type.

(Spices Newsletter 16(10); 1982; 4)

IMPORT

75 Imports of skimmed milk powder

Year	Quantity in tonnes	Value (rupees in lakhs)
1976-77	27,767	2,589.04
1977-78	19,641	1,750.07
1978-79	26,474	2,514.74

(Indian Dairyman 34(7); 1982; 10)

TRADE INFORMATION

76 Higher support price for pulses

The Centre today announced increased support price for pulses. For the fair average quality of tur, the price will be Rs. 215 a quintal for the 1982-83 marketing season, as against Rs. 190 a quintal announced in 1980-81. The minimum support price for the fair average quality of urad has been fixed at Rs. 230 a quintal and of moong at Rs. 240 a quintal for the 1982-83 season (Rs. 200 a quintal for both urad and moong fixed for 1980-81 season).

The National Agricultural Cooperative Marketing Federation will be the central agency for undertaking market support operations in case the prices tend to fall below the support level. Under the new 20-point programme, priority has been given to increasing the production of pulses. Intensive efforts have been mounted for this purpose. The prices have been fixed with a view to sustaining the tempo of production of pulses.

(Hindu, December 20, 1982; 1)

77 Importers of fruits/vegetables products

I. Importers of Fresh Tropical Fruit & Vegetables.

Scipio Fruchtvertrieb KG
Breitenweg 29 (Fruchthoof)
Postfach 52
2800 Bremen 1

Afrikanische Frucht-Compagnie
Laeisz & Co.,
Trostbruecke 1
2000 Hamburg.

Fruchthansa
Grelinger, Haessy & Heep
Grossmarkthalle
5000 Cologne 51

Afro-Asiatische Fruechte GmbH & Co. KG
Grossmarkthalle
6000 Frankfurt/Main 1

Neinrich Breuers Import GmbH
Postfach 680
Heiliger Weg 60
4600 Dortmund

Paul Grossnick
Grossmarkthalle
6000 Frankfurt 1

International Fruchtimport
Gesellschaft

Weichert & Co.,
Oberhafenstrasse 1
2000 Hamburg 1

Willem van der Schalk
Kontrhaus Grossmarkt,
Lippelstrasse 1
2000 Hamburg 1

Port, Scholdei & Co. GmbH
Lippelstrasse 1
2000 Hamburg

Anton Duerbeck
Fruchtimport-Grosshandel
Grossmarkthalle
6000 Frankfurt/Main 1

J.A. Kahl
Fruchthof, Oberhafen 5
2000 Hamburg 1

D. Lehmann Soehne
Hars & Hagebauer
Oberhafenstrasse 1
2000 Hamburg 1

Importers of Fresh Tropical Fruit & Vegetables (contd.)

F. Van der Hamm GmbH
Grossmarkt
7000 Stuttgart-Wangen

HAMEICO
Postfach 52
2800 Bremen

II. Agents/Importers of Tropical Fruit Products

Main line of activity and
principal products

AHAG Aussenhandelsgesellschaft mbH
Sontheimer Strasse 4
7100 Heilbronn/Meckar

Importer

H.W. Appel Feinkost AG
Engelbosteler Damm 72
3000 Hannover

Importer/manufacturer

Alois Dallmayr
Dienerstrasse 14/15
8000 Munich 1

Importer/retailer

Wemer Faust
Wandsbeker Stieg 41
2000 Hamburg 76

Agent/Importer

J. Heimerdinger
Neuer Wall 34
2000 Hamburg 36

Importer/retailer

Charles Hosie GmbH
Spitalerstrasse 16
2000 Hamburg 1

Agent/importer

Franz Hoenekopp KG
Leopoldstrasse 7
4000 Duesseldorf

Importer

IMEXA GmbH
Leuscherstrasse 28
7000 Stuttgart 1

Importer
Mainly mango products

International Emporium Aussenhandels-
Uhlandstrasse 66 GmbH
2000 Hamburg 76

Importer
Mainly mango products.

Feinkost Kaefer KG
Prinzreg. Str. 73
8000 Munich 80

Importer/retailer

V. Lind & Co.
Hohe Bleichen 22
2000 Hamburg 36

Agent/importer

L.W.C. Michelsen
Gr. Bleichen 10-16
2000 Hamburg 36

Importer/retailer

Agents/Importers of Tropical Fruit Products (contd.)

Peter Mohr oHG Friedrich-Ebert-Str. 3 6122 Erbach	Agent
Wilhelm Philipp Postfach 20 8355 Hengersberg/Ndb.	Importer/manufacturer
Carl Ploeger oHG Gr. Bockenheimer Str. 30 6000 Frankfurt/Main	Importer/retailer
Raoul Rosso Moenckenbrock 2061 Elmenhorst	Importer
George Schepeler Mainzer Landstr. 149 6000 Frankfurt/Main 1	Importer/retailer
Skandinavieu-u, Sued-Import Max Bauerfeind KG Birketweg 5 8000 Munich 19	Importer
W and S Import GmbH Lohmarer Str. 38 5201 Troisdorf Bez. Koeln	Importer
Wachsmuth and Krogmann Mundsbürger Damm 6 2000 Hamburg 22	Agent

(*Profodcil Bulletin* 16(3); 1981; 48-50)

78 Trade enquiries

Name of the Party	Items of interest
N.V. Daarnhouwer & Co. 'Leys Bldg' Kipdorpevest 40/42 Antwerp 1.	Dessicated Coconut Bitter Apricot Kernels Melon Kernels
Appel and Frenzel, Kieshecker Weg 240, 4000 Dusseldorf 30.	Mango Chutney Pink Pepper in Brine Tamarind Concentrate
Lothar Gorzaika, Danziger Strasse 35, 2000 Hamburg 1	Walnut Kernels and Cashew Kernels.
Lorraine International S.A. 5 Passage Deia Gatinelle, 91360 Epinay/Orge	Frozen Fruits
F Url and C Ranbergasse 20, 8011 Graz	Canned Foods

Contd.

Sultan Ben Essa Sons Co. Ltd.,
P.O.Box 4098, Safat
Kuwait.

Afriham Gmbh.,
Hofweg 6,
2 Hamburg 76.

Pharbigarm,
DK 4360
Kirke-Eskildstrup.

Brugger Handels-AG
Waisenhausstrasse 2,
8023 Zurich.

Neridiana,
4, Wollesen,
Via Castelveccchio 18,
139052 Caldoro.

Kiaus Bocker Gmbh and Co.,
Kiefernwe 14,
2114, Hollenstedt.

ETS Lenoble-IA Pulpe,
94 Avenue De Lorraine
Fruileg 221 - 94572 Rungis.

Mulgan Gmbh.,
4190, Kleve, Postfach 1526,
Emmericher Strasse 109.

Bruckner - Werke
Ost - West - Strasse 49,
2000 Hamburg 11.

Oayala Pere and Fils,
Les Mazères - Lunac,
12270, Najac.

Bee and Cee Foods Ltd.,
Valley Road,
Birkenhead, Merseyside L 417 ED.

Horst K. Danner,
Labertalstrasse 4,
8411 Alling/Regensburg.

Supermachs,
Avenue Des Olymplades 20,
1140, Brussels.

Laiterie De Curepipe Ltee,
Rue Koenig, Curepipr,
Mauritius.

Parmal Rice

Canned Chickpeas

Fruit and Nut Chutney
in Bulk

Dried Morels

Tropical Fruit Juices in Bulk

Tropical Fruit Pulp

Natural Tropical
Fruit Pulp

Tapioca Chips
Tamarind Kernel Powder
Guar Gum

Dried Morels, Black Fungus
Dehydrated Onion and Garlic

Basmati Rice

Pineapple Slices and
Titbits

Dehydrated Vegetables,
Onion Garlic and Dried Morels.

Mango, Papaya, Guava Juice,
Mango, Papaya & Guava Slices.

Fruit Juices and Pulps.

Contd.

Delikatessen,
Import - Grosshandel,
1030 Wien, Geusaugasse 5.

Carl Lange and Co. A/s.,
37-39 Sigwidsgade,
DK-2200 Copenhagen.

(*Profodcil Bulletin* 16(3); 1981; 14-15)

Dehydrated Onion Flakes

Mango Chutney

79 Importers of mangoes

Saudi Arabia

Abbar & Zainy Cold Stores,
P.O. Box 2495,
Jeddah.

Saudi Cold Storage,
P.O. Box 5507,
Jeddah.

Arabia Trading Co. for Cold Storage,
P.O.Box 1393,
Jeddah.

Sharbatly Cold Stores,
P.O. Box 1592,
Jeddah.

Abdullah Ali al Munajjim,
P.O.Box 2395,
Riyadh.

Khalifa Al Gosaibi Cold Stores,
P.O.Box 222,
Dammam.

Sultanate of Oman

Matrah Cold Stores,
P.O.Box 4158,
Ruwi.

Oman Cold Stores,
P.O.Box 831,
Muscat.

Ramniklal B. Kothary
P.O. Box 66,
Muscat.

Ruwi Center Supermarket,
P.O.Box 361,
Ruwi,

Sharikat Fanniya Amaniya,
P.O.Box 4949
Ruwi.

P.N. Gandhi,
P.O.Box 185,
Muscat.

Switzerland

Bettio AG
Fuchsenstrasse 9,
8840 Einsiedeln

Trembley & Burgermeister SA
49 route des Jeunes
Case Postale 287
1211 Geneva 26

Georges Helfer SA
Rue des Fosses 45
1110 Morges

Coop Suisse
Thiersteinerallee 14
Case Postale 1285
4002 Basel

Migros
152 Limmatstrasse
Case Postale 226
8031 Zurich

Bondi & Herzig AG
Untersteckholzstr, 54
4900 Langenthal

Liebllich AG
Solothurnerstrasse 50
Case Postale
CH-4008 Basel

Switzerland (contd.)

J. Berri Ltd.,
Engrosmarket Herdern
Aargauerstrasse 1
8048 Zurich

Federal Republic of Germany

Afrikanische Frucht-Compagnie
GmbH & Co.
Trostbrücke 1,
D-2000 Hamburg 11

Weichert & Co.
International Fruchtimport Gesells-
schaft

Oberhofenstrasse 1,
2000 Hamburg 1

Fruchthansa GmbH & Co. KG
Grossmarkt
5000 Köln 51

Anton Durbeck
Grossmarkthalle
6000 Frankfurt am Main 1

Belgium

Ets. A. De Ridder & Fils
Quai des Usines 112-154
Magasines 1-2
1020 Brussels

Fruitbrokers Company N.V.
Ankerrui 3
2000 Antwerp

United Kingdom

Francis Nicholls Ltd.,
London Fruit Exchange
Brushfield St.
London E1 6 HG 1

Fyffes Group Ltd.,
Central Produce Supply and Distribuion
231-235 Suite F
Fruit and Vegetable Market
New Convent Garden,
London SW 8 5 EW

Scipio Fruchtvertrieb KG
Breitenweg 22/33
2800 Bremen 1

J.A. Kahl GmbH & Co.
Bauernbraweg 1
8000 München 70

F.A. Paul Grassnick
Grossmarkthalle
6000 Frankfurt

J.A. Kahl GmbH & Co.
Fruchthof
2000 Hamburg 1

T. Port
Lippelstrasse 1
2000 Hamburg 1

Agrofruit Company (Belgium) Sprl.
Frankrijklei 78 bus 3
2000 Antwerp

A.V.M. Fruits
182 Brussellsesteenweg
B-9380 Lebbeke

J.P. Fruit Distributors Ltd.
T/as Broome & Green
II 291 Earlbridge
Fruit and Vegetable Market
New Convent Garden
London SW8 5 EW

Louis Konyn & Sons Ltd.
D 103/104 New Convent Garden Market
London SW 8 5 LL

R.E. Jenkinson
B 25-31 Fruit and Vegetable Market
New Convent Garden
London SW 8 5 LL

United Kingdom (contd.)

Louis Reece Limited
99 Commercial Street
London, E 1

Ridley & Houlding (Spitalfields)
Ltd.

Eden House,
Spitalfields Market
London E 1

Saphir, Sons & Co. Ltd.
London Fruit Exchange
Brushfield St.
London E 1 6 HG

Wealmoor Ltd.
15 Westfield Lane
Kenton, Middlesex

K. & M Veg. Fruit Ltd.
58 Folgate St.
London E 1

Triangle Imports Ltd.
416 St. James Market
Bradford 4

Butt & Co. Ltd.
Wholesale Market Precinct
Pershore St
Birmingham 5

France

Primel S.A.
2 Ave de Flandre
Batiment E 4
94587 Rungis Cedex

Fruit Uni
5 Rue de la Corderie
B.P. 315
Rungis Cedex

Roland Lacour S.A.
106 rue de Montpellier
Bat C2 Fruleg 375
94622 Rungis Cedex

Societe Pomona
21 rue du Pont-Neuf
75039 Paris Cedex 01

Ets Klein et SPPM reunis
8 rue des Tropiques
94538 Rungis Cedex

T.J. Poupart
D 153-162 Fruit and Vegetable
Market

New Convent Garden,
London SW 8 5 LL

F.T.K. Limited
58-59 London Fruit Exchange
Spitalfields Market
London E 1 6 EP

J.O. Sims Ltd.
Winchester Square
Borough Market
London SE 1 9AQ

/M Sharif & Co.
Wholesale Market Precinct
Pershore St
Birmingham 5

Ghura & Co
133 Commercial St
London E 1

Agrunord S.A.
2 rue de Provence
94619 Rungis Cedex

Super-gros S.A.
14 A Avenue de Bretagne
Fruleg 152
94522 Rungis Cedex

Compagnie Fruitiere
33 Blvd Ferdinand de Lesseps
13014 Marseille

Societe Pomona
21 rue du Pont-Neuf
75039 Paris Cedex 01

Comptaco S.A.
38 Rue Manin
75019 Paris

France (contd.)

Georges Helfer S.A.
Rue de la Tour
Centra 221
94576 Rungis Cedex

E. Azoulay & Cie
2 rue dex Tropiques
94538 Rungis Cedex

(*Profodcil Bulletin* 16(4); 1982; 26-30)

TRANSFER OF TECHNOLOGY AND NEW INDUSTRIES

Nil

FOOD REGULATION, QUALITY CONTROL AND HYGIENE

REGULATION

80 Gum karaya grading and marking rules 1982

GSR 646 - Whereas a draft of the Gum Karaye Grading and Marketing Rules, 1981 was published, as required by Section 3 of the Agricultural Produce (Grading and Marketing) Act, 1937, (1 of 1937) at pages 2271 to 2274 of the Gazette of India, Part II, Section 3, Sub-section (i), dated the 17th October 1981 under the notification of the Government of India in the Ministry of Rural Reconstruction No. GSR 937, dated the 25th September, 1981, inviting objections and suggestions from all persons likely to be affected thereby before the expiry of the period of forty five days from the date of publication of the said notification in the Official Gazette;

And whereas the copies of the said Gazette were made available to the public on 2nd November 1981;

And whereas no objections/suggestions in respect of the said draft have been received by the Central Government;

Now, therefore, in exercise of powers conferred by Section 3 of the said Act the Central Government hereby makes the following rules, namely:-

RULES

1. Short title, application and commencement - (1) These rules may be called the 'Gum Karaya Grading and Marking Rules, 1982;

(2) They shall apply to Gum Karaya Produced in India;

(3) They shall come into force on the date of their publication in

the Official Gazette.

2. Definitions - In these rules, unless the context otherwise requires

- (1) "Agricultural Marketing Adviser" means the Agricultural Marketing Adviser to the Government of India;
- (2) "Schedule" means a Schedule appended to these rules;
- (3) "Authorised packer" means a person or a body of persons who has been granted a Certificate of Authorisation by the Agricultural Marketing Adviser, for getting the commodity graded and marked in accordance with grade standards and Procedure prescribed under these rules;
- (4) "Certificate" means certificate of authorisation.

3. Grade designation -- The grade designation to indicate the quality of the Gum Karaya shall be as set out in Column 1 of Schedule I.

4. Definition of quality - The quality indicated by the grade designation shall be as set out against each grade designation in columns 2(a) to 4 of Schedule I.

5. Grade designation mark - The grade designation mark shall consist of a label specifying the grade designation and bearing a design consisting of an outline map of India with the word "AGMARK" and figures of the rising sun with the words "Produce of India" and "भारतीय उत्पाद" resembling the mark as set out in Schedule II.

6. Method of marking - (1) The grade designation mark shall be securely affixed to each container in a manner approved by the Agricultural Marketing Adviser.

(2) In addition to the grade designation, the following particulars shall also be clearly marked on the label:-

- (a) Crop Season;
- (b) Net weight;
- (c) Place of packing;
- (d) Date of packing; and
- (e) Any other particulars, as may be specified by the Agricultural Marketing Adviser from time to time.

(3) The authorised packer may, after obtaining the prior approval of the Agricultural Marketing Adviser, mark his private trade mark on a container in a manner approved by the said officer, provided that the private trade mark does not represent a quality of grade of Gum Karaya different from that

indicated by the Grade designation mark, affixed to the container in accordance with the rules.

7. Method of packing - (1) Gum Karaya shall be packed in double gunny bags or any other type of container of such capacity and in such a manner as may be specified from time to time by the Agricultural Marketing Adviser. Whilst the inner bag shall be clean and sound, the outer bag shall be completely new.

(2) Packing material shall be clean and dry, free from fungus and insect attack and obnoxious smell.

(3) Each package shall contain Gum Karaya of the same crop season and of the same grade designation.

(4) Each package shall be securely closed and sealed in the manner prescribed by the Agricultural Marketing Adviser.

SCHEDULE 1

(See rules 3 and 4)

Grade designation and definition of quality of Gum Karaya (Crystals) commercially known as Katila, Karaya or Kullo.

Grade designation	Definition of quality		General characteristics	
	Special characteristics			
	Colour			Foreign matter percent by weight (Max.)
	Summer Crop	Winter/Monsoon Crop		
1	2(a)	2(b)	3	4
No.1	White with slight grey and yellow cast	Dull white	1.5	Gum Karaya Crystals shall: (1) be derived from the exudes of the plant Sterculia ur-ens. (2) be reasonably dried,uniform in shape and size. (3) be free from rodent excreta, rodent filth and heir, fun-us attack, insect infestation. (4) have characteristic solubility
No.2	Pale yellow to light ten and brown	Dull white to greyish to amber	3.0	
No.3	Brown and dark brown with slight black cast	Dull yellow to brown dark	5.0	
No.4	Dark brown to black	Dull brown to black	8.0	
No.5	Black and mixed	Black and mixed	10.0	

Definition : Foreign matter: Shall include bark, leaves, dust, dirt, stones pieces or any other Organic and inorganic matter other than Gum Karaya.

(Gazette of India, Part II, Section 3, subsection (i); July 31, 1982; 1883-8)

81 Coated mild steel as a substitute for stainless

Loyne (Manchester) Ltd. are introducing their P3066 applicator service to plant engineers. Loyne of Globe Lane Works, Dukinfield, Cheshire SK16 4UY, say they have never worked with a phenolic which is as stable in every application. Its big advantage is that it allows the substitution of mild steel vessels coated with P3066 for the more costly stainless steel. The coatings are also extremely durable, easy to clean and the purity of surface and non toxic composition allows their use in solid and liquid food and drinks manufacturing and processing.

(Food Trade Review 51(2); 1981; 80)

82 Coating meets hygiene requirements

A glossy, easy to clean surface, which meets EEC standards of hygiene, can be obtained with Luptile, an epoxy resin-based coating manufactured by Lupdine Ltd. of Fernie Road, Market Harborough, Leics. Highly resistant to chemical attack and bacterial growth, Luptile can be used to combat problems caused by high humidity, mould development and organic waste, apparently.

The coating, a two-component resin-based system, comes in a range of standard colours and builds to give a tough, jointless surface with the appearance of ceramic glazing. It can be applied to suitably prepared surfaces of metal, concrete, plaster, brick, asbestos, cement sheet and wood.

(Food Trade Review 51(10); 1981; 566)

HYGIENE

83 Inhibitory effect of wheat bran on iron absorption.

Researchers from the University of Kansas Medical Centre, and the USDA's Nutrition Institute in Beltsville, M.D., have recently reported on the inhibitory effect of wheat bran on iron absorption in humans. They found that when 12 g. of wheat bran were added to a light meal, the bran was responsible for a reduced iron absorption of 74% and for a reduction of

51-58% when the meal contained either meat or ascorbic acid. When dephytinized bran was separated into a soluble, phosphate-rich fraction and an insoluble, high-fiber fraction, the soluble fraction was more inhibitory than the insoluble fraction.

(*Cereal Foods World* 26(10); 1981; 575)

84 FASEB finds no safety problem with gluten

The select committee on GRAS Substances of the Federation of American Societies for Experimental Biology (FASEB) has concluded that no evidence exists that wheat gluten, corn gluten and zein, glucono delta-lactone, or peptones are hazards to the public when any is used "at levels that are current or that might reasonably be expected in the future".

In the evaluation of the glutens, the committee reported that patients with celiac disease "are intolerant to gluten of wheat and rye but not to corn gluten or zein". It said that, although some authors have suggested that consumption of gluten may be a factor in pathogenesis of schizophrenia, "further study will be necessary before placing much weight on such a relationship".

(*Cereal Foods World* 26(6); 1981; 312)

85 Pesticide residue level in agricultural raw materials

The FDA has decided that it will not initiate regulatory action when it finds pesticide residues in raw agricultural commodities that will be further processed in a manner that will reduce the pesticide to levels that are no longer of regulatory concern. The FDA stated this policy recently in a case involving coffee beans that contained residues of Lindane.

The agency is expected to apply the same principle to crude sunflower seed oils that will undergo refining to eliminate illegal residues of malathion. There are no tolerances for malathion residues for sunflower seeds or oils.

The FDA recently analyzed refined sunflower seed oil made from crude oils containing malathion residues to determine if the refining process reduced the level of the residues. Analysis conducted at FDA laboratories and at Procter & Gamble indicated that the refined oils did not contain detectable levels of the malathion.

(*Cereal Foods World* 26(6); 1981; 311)

86 Pesticide diflubenzuron tolerance set for soy

The Federal Environmental Protection Agency has approved the following tolerance levels for the insecticide diflubenzuron in or on soybeans, soybean hulls and soybean soapstock: Soybean tolerance of 0.05 parts per million; soybean hulls, 0.05 ppm; and soybean soapstock, 0.1.

(Journal of the American Oil Chemists Society 59(10); 1982; 793A)

87 Canadians seek approval for canola oil in U.S.

The Food and Drug Administration in August announced that the Research Branch of Agriculture Canada had petitioned for generally recognized as safe (GRAS) status for low erucic acid rapeseed oil as a food ingredient. The petition proposes that low erucic acid rapeseed oil and hydrogenated low erucic acid rapeseed oil be used as food ingredients similarly to other edible fats and oils.

(Journal of the American Oil Chemists Society 59(10); 1982; 792A)

88 FDA proposes GRAS status for lecithin, Carnauba

The Federal Food and Drug Administration has proposed issuing a Generally Recognized as Safe (GRAS) affirmation for lecithin used in food with no limitation other than current good manufacturing practice. The affirmation would include both bleached and unbleached lecithin. In addition, FDA is proposing affirming the GRAS status of carnauba wax as an anticaking agent, lubricant and release agent, and as a surface-finishing agent.

(Journal of the American Oil Chemists Society 59(10); 1982; 793A)

89 Vegetable oil products control order (Amendment)

GSR 569(E) - In exercise of the powers conferred by sub-clause (1) of clause 4 and sub-clause (1) of clause 4B of the Vegetable Oil Products Control Order, 1947, the Vegetable Oil Products Controller for India hereby makes the following Order further to amend the Order of the Government of India in the Ministry of Civil Supplies No. GSR 717(E) dated the 26th December, 1980, namely :-

In the said Order, ' In the Table, in proviso to item 1, in column (1), for the figures, sign, brackets and words "70 per cent (seventy per cent)" the figures, sign, brackets and words "80 per cent (eighty per cent)",

shall be substituted.

Note: Principal Order published vide GSR No. 717(E) dated the 26th December, 1980 (Gazette of India Extraordinary, Part II, Section 3, sub-section (i) dated the 26th December, 1980 subsequently amended by:

- (i) Order No. 505(E) dated 2.9.1981
- (ii) Order No. 568(E) dated 30.10.1981
- (iii) Order No. 80(E) dated 25.2.1982
- (iv) Order No. 247(E) dated 12.3.1982
- (v) Order No. 524(E) dated 17.8.1982

(Gazette of India (Extraordinary) Part II, Section 3, subsection (i); September 13; 1982; 2)

90 Prevention of food adulteration (fifth amendment) rules 1982

GSR 476(E) - Whereas certain draft rules further to amend the Prevention of Food Adulteration Rules, 1955 were published as required by Sub-section (1) of Section 23 of the Prevention of Food Adulteration Act 1954 (37 of 1954) with the notification of the Government of India in the Ministry of Health and Family Welfare (Department of Health) No. GSR 469(E) dated 3rd August, 1981 at pages 1449 to 1450 of the Gazette of India (Extraordinary) Part II, Section 3, Sub-section (i) dated the 3rd August, 1981 for inviting objections and suggestions from all persons likely to be affected thereby before the expiry of ninety days from the date on which the copies of the official Gazette in which the said notification was published were made available to the public:

And whereas the copies of the said Gazette were available to the public on 3rd August 1981;

And whereas the objections and suggestions received from the public on the said draft rules have been considered by the Central Government;

Now, therefore, in exercise of the powers conferred by sub-section (1) of Section 23 of the said Act, the Central Government after consultation with the Central Committee for Food Standards, hereby makes the following rules further to amend the Prevention of Food Adulteration Rules, 1955, namely:-

RULES

1. (1) These Rules may be called the Prevention of Food Adulteration (Fifth Amendment) Rules, 1982.

(2) They shall come into force on the date of their publication in the Official Gazette.

2. In the Prevention of Food Adulteration Rules, 1955, in rule 44, after the first proviso, the following further proviso shall be added, namely:

"Provided that proprietary food articles relating to clause (i), the labels of which are approved under the provisions of rule 37-A, shall be exempted from the operation of this rule".

(Gazette of India Part II, Section 3, Subsection (i); June 29, 1982; 1-2)

91 Prevention of Food Adulteration (Fourth Amendment) Rules 1982

GSR 422(E) - Whereas certain draft rules further to amend the Prevention of Food Adulteration Rules, 1955, were published as required by Sub-section (1) of section 23 of the Prevention of Food Adulteration Act, 1954 (37 of 1954), with the notification of Government of India in the Ministry of Health and Family Welfare (Department of Health). No GSR 674(E) dated the 26th December, 1981 at pages 1947-1948 in the Gazette of India, Extraordinary, Part II, Section 3, Sub-section (i), inviting objections and suggestions from all persons likely to be affected thereby before the expiry of fortyfive days from the date on which copies of the Gazette of India in which the said notification was published were made available to the public;

And whereas the copies of the said Gazette were made available to the public on the 26th December, 1981.

And, whereas the objections and suggestions received from the public or the draft rules have been considered by the Central Government.

Now, therefore, in exercise of the powers conferred by Sub-section (1) of Section 23 of the said Act, the Central Government after consultation with Central Committee for Food Standards, hereby makes the following further to amend the Prevention of Food Adulteration Rules, 1955, namely:-

RULES

1.(1) These rules may be called the Prevention of Food Adulteration (Fourth-Amendment) Rules, 1982.

(2) They shall come into force on the date of their publication in the Official Gazette.

2. In the Prevention of Food Adulteration Rules, 1955, in Rule 2, in clause (c), after sub-clause (iii), the following sub-clauses shall be inserted, namely :-

"(iv) in the case of an ordnance factory or equipment factory, the General Manager of such factory or equipment factory or both".
(Gazette of India (Extraordinary), Part II, Section 3, subsection (i);
May 24, 1982; 1-2)

PERSONALIA

92 Food Corporation Chief

Mr. Sawal Singh Sisodia till recently Ministry of State for Finance has been appointed Chairman of the Food Corporation of India (FCI). He succeeds Mr. P. Ramachandran who was appointed Kerala Governor some time ago.

(Hindu, December 19, 1982; 12)

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RAW MATERIALS

3 Energy nuts

The nuts of Bangilumbang tree in Philippines can be a good source of energy; these are highly combustible and a single nut can burn for 15 minutes, emitting a yellow flame with sooty smoke smelling like burning kerosene. A single tree can yield about 120-140 (22-litre can fulls) nuts per year. About 250-300 trees can be grown on a hectare of land, of any type of soil, and start bearing nuts five years after planting. (*Invention Intelligence* 17(5); 1982; 188)

STORAGE AND INFESTATION CONTROL

4 Coat vegetables and fruits for longer shelf-life

Any protective method adopted should care for retention of natural appearance, colour and quality of vegetables and fruits. It is better if the coating can add gloss/shine at lower cost. An easier method which can be tried by any housewife is based on the use of polyvinyl alcohol (PVA). For preparing a solution of PVA in water, add a definite quantity of PVA to water and stir. It dissolves very slowly. Vegetables and fruits are dipped in the solution and taken out. Excess solution is drained off. Once the coating is dry (in air) the vegetables and fruits are ready for storage.

The thickness of the dry film formed depends on the concentration of the PVA solution and the number of dips given. If thicker coatings are desired, the concentration of the PVA solution is to be increased. Alternatively, the dip and dry process can be repeated to get thicker films. Thicker films will be beneficial if more frequent handling of vegetables and fruits are expected. Instead of dipping, spraying can also be done with the same solution.

Before using the coated vegetables and fruits for edible purposes, they are to be thoroughly washed with a large quantity of water to remove the film. The dried film is also soluble in water. Brinjal, green chillies, etc. were seen to last longer if protected by this method.

(*Invention Intelligence* 16(12); 1981; 514)

95 Preservation of fish

Institute de Investigaciones Technologicas, has developed a low cost process for preservation of fish. In this process, the split fish are buried in salt until the body fluids form a brine liquor. At 30 C, 72% relative humidity, the climatic conditions can be used for the salting/drying process. If relative humidity is high (80-90%) salting is followed by drying. The product is sealed in polyethylene film bags and has a storage life of three months at 25 C and 85% relative humidity.
(*Cardamom* 15(2); 1982; 21)

96 Ice box-cum-water jug

Milton Plastics' Kool Pack Mark II is a plastic ice box-cum-water jug that is insulated with Thermil Super Insulating Foam (polyurethane foam). It can be used to store and keep cool 15 soft drink bottles for over 24 hours. The lid of the jug is moulded in such a way that it can be used as a serving tray for snacks and 4 glasses/bottles. Just below the lid is a tray to keep snacks in. The handle locks the lid in both the carrying and resting positions. The jug has a tap with a filter to facilitate the use of the pack as a water jug.

(*Industrial Products Finder* 11(Annual Number); 1982; 224)

97 Storage tanks

The Petro-Flex and Chem-Flex flexible storage tanks, manufactured by Aero Tec Laboratories, Inc. of USA, are collapsible rubberised tanks. They are available in 16 different capacities from 378.5 to 3,78,500 litres and are capable of storing water, crude oil, gasoline, alkalies, diesel, acids, alcohols, etc. The tanks are manufactured of heavy duty nylon, polyester or aramid fabrics impregnated with elastomers such as, polyurethane, hypalon neoprene, nitrile, butyl, etc.

(*Industrial Products Finder* 11(Annual Number); 1982; 244)

FOOD ADDITIVES

Sorbates extend shelf life of rolls

Tests at a commercial bakery showed that brown and serve rolls sprayed with oil containing one per cent by weight of sorbic acid can increase the mould-free shelf life by an average of 11 days longer than rolls sprayed with oil alone. In conducting the tests, oil containing sorbic acid was applied at the rate of 6.1-6.4 g per dozen rolls. By including 2.5 per cent of sorbic acid in the brown and serve oil, enough mould protection can be provided so that bakers can reduce by one-half the amount of calcium propionate added to the dough and still extend the shelf life by 50 per cent or an additional four days. Less propionate in the dough means less inhibition of the yeast, so bakers can decrease their total yeast requirement.

The same mould protection and savings can be achieved by replacing all the propionate in the dough with approximately 0.03 per cent of sorbic acid (0.5 oz of sorbic acid per 100 lb of flour). With sorbic acid added to the dough and sprayed on the surface of the rolls with the oil, bakers can enjoy the benefits of using only one preservative to help keep the product mould-free. In addition, sorbic acid in the dough acts as a mix-time reducer and can cut mix times by as much as 30 per cent. For those bakers who use a water oil emulsion pan release agent, the addition of approximately three per cent by weight of potassium sorbate can extend the mould-free shelf life of brown and serve rolls by as much as 150 per cent or an average of 12 days longer than rolls sprayed with the pan release agent alone. Also, since potassium sorbate added to the pan release agent provides mould protection, the amount of calcium propionate and yeast used in the dough can be reduced.

(*Food Trade Review* 52(3); 1982; 147)

Indian gum makes healthier bread

So-called slimming or high-fibre breads are very little better than the much-maligned sliced white loaf, on the basis of "calories" per ounce (or kilojoules per kilogram). But guar bread, newly-created by British food chemists, not only has a high fibre content but actually

has 25 per cent fewer calories per ounce. The new bread, which looks and tastes like ordinary bread, can help diabetics and people with high levels of cholesterol in their blood.

Guar gum comes from the endosperm of the Indian cluster bean (*Cyamopsis tetragonolobus*) which produces the gum to store polysaccharide. Guar is cheap and plentiful and is already used in some foods as a natural stabiliser. Furthermore, some forms of dietary fibre reduce blood cholesterol, and guar gum does this even more efficiently than the archetypal fibre, wheat bran.

But making bread with large amounts of guar-more than 10 percent - creates problems. It is a gum and in water produces a very viscous solution even at low concentrations. So much more water is needed to get a workable dough. Moreover the baked bread tends to collapse on cooling or to be uncooked in the centre.

But bread with 5 per cent guar bakes well and tastes like ordinary bread. With 10 per cent guar, tasters noticed a difference but still found the bread quite pleasant. The 10 per cent guar loaf has 25 per cent less digestible carbohydrate, and hence 25 per cent fewer calories, than white bread, yet it has three times more fibre. The bread wards off hunger for as long as the same weight of ordinary bread despite its lower starch value. And guar improves the texture of brown bread.

Food chemists have investigated guar bread in the hopes of finding a palatable way of increasing the fibre in the diet of diabetics. Their success has wider implications. Guar bread appears to be the answer to the baker's prayer, it counters the popular belief that all bread is fattening and that white bread is too refined to be healthy. Guar bread's twin features of higher fibre and fewer calories may be the best thing to have happened to the bread industry since sliced bread.

(*New Scientist* 97(1343); 1983; 305)

BYPRODUCTS AND WASTE UTILIZATION

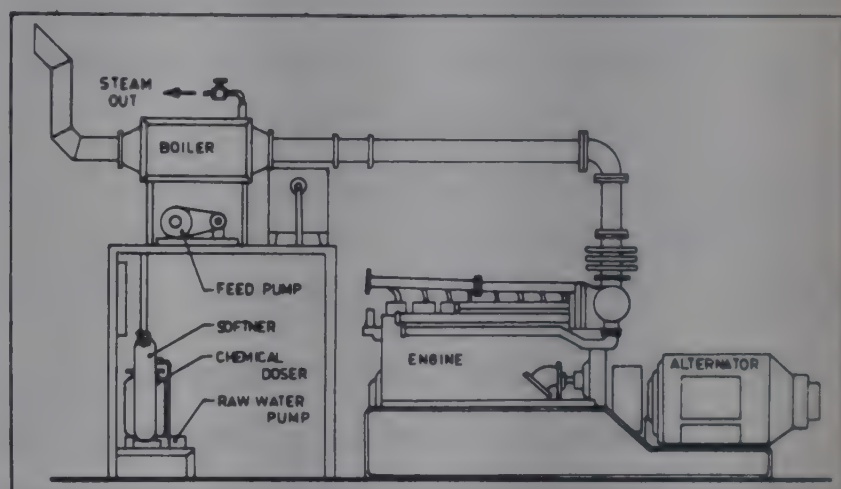
100 Debittered citrus peel extract

Israeli scientists have developed a process for extracting sweet juice from citrus peels which are left over as low value by-product in the fruit juice industry. The de-bittered peel extract will find application in the manufacture of various food products and is expected to reduce the consumption of sugar. The process uses no chemical additives and consumes only minimal amounts of energy.

(*Invention Intelligence* 17(5); 1982; 188)

101 Waste heat recovery system

Kirloskar Electrodyne's waste heat recovery units are reportedly designed to reduce cost of captive generation to save fuel energy generally lost in overcoming friction, jacket water and and exhaust/combustion gases of the engine. Recovery of about 50% of this waste heat is possible from the engine cooling water and exhaust gases. The recovered heat is used normally for



heating water or generating steam, thus providing energy in part/full for process heat. Fluid heater Type WV-WH 300/400 is a cross heat exchanger that extracts heat from exhaust gases. Steam boiler Type WV-SB 300/400 consists of water treatment system, feed pump, water tube boiler, control panel and mountings.

(*Industrial Products Finder* 11(5); 1983; 87)

PROCESSES

102 Separation of the imperfect grain

At Japan's Kyota University, ASAEer Ritsuya Yamashita and colleagues seek a practical method of separating the broken or unripened grain from

the mature kernels. A specific goal is a separation method appropriate for rice processing facilities. Their approach has been an analysis of the mechanism of separation and the factors influencing separation. Key separator characteristics include cylinder design and speed; physical properties of the grain; and operating factors such as separating time, hopper angle, and grain quantity. Use of the indent cylinder separator to establish the ratio of broken kernels is also being analyzed.
(*Agricultural Engineering* 63(1); 1982; 9)

103 New process for maintaining natural colour of canned green vegetables

Trade named "Veri-Green", the process is based on a coating in the metal can which prevents the loss of natural green colour. The heat of the retorting process normally causes green vegetables to lose their natural colour. The presence of an active container coating in the Veri-Green process counteracts their effect and preserves the vegetables' fresh, green colour.

(*Food Production Management* 105(6); 1983; 58)

104 Processing peas and lima beans without adding salt

A technique studied by the U.S. Department of Agriculture looks promising for reducing the amount of sodium in frozen peas and lima beans. Peas and beans pick up salt during conventional grading because they are floated in a sodium chloride brine. Charles C. Huxsoll, agricultural engineer with USDA's Agricultural Research Service, Berkeley, Calif., suggested that specific gravity tables can be used to grade fresh peas and beans. These tables, now *in* use for grading dried seeds and other dry granular materials, employ the physical effects of vibrating conveyance, air flotation, and gravitational force to separate light and heavy particles. Results of some preliminary tests with peas on a gravity table were encouraging.

(*Food Production Management* 105(4); 1982; 18)

105 Solvent extraction of groundnut oil

Hexane vapours are used to extract oil from roasted, deskinⁿed groundnut kernels, and the oil-hexane mixture is distilled to separate the oil

from the hexane. The latter is then recycled. The entire operation is automatic and requires only 200 W of power to de-oil 20 kg. of groundnuts. Attempts are being made to run the plant on solar energy. The whole kernels left behind are free from fat and solvent, and are rich in protein (55%); The de-oiled kernels taste like Bengal gram, but their original taste can be retained if the oil is extracted only partially and not completely. The extracted groundnuts are undergoing toxicity tests at present. Moreover, a nematicide has been extracted, as a by-product, from the groundnut skins.

(Oils and Oilseeds Journal 34(10/11/12); 1982; 44)

106 Canned coconut water and milk

A small scale entrepreneur in Singapore has perfected a process for canning coconut water and milk without the use of additives or preservatives. Basically it involves an Ultra High Temperature (UHT) treatment and packing the solutions aseptically.

(Documentation Bulletin No. 49; 1982; 15)

107 Dried prawns

Process for the preparation of semi-dried and hard dried prawns have been worked out. The prawns are blanched in 6% brine for 2-3 min. After shelling the meat is immersed in cold saturated brine (25 Be) for about 15 min. The brined prawns, after draining off excess brine are dried in an electric oven at 50 C till the prawns become 'Rubber like' and 'Orange-pink' in colour with a moisture content of about 44.5% or hard dried to a moisture content of 21.7%.

(Documentation Bulletin No. 49; 1982; 15)

108 Dry ice cooling for improved mincing

Key Markets Ltd. investigated the use of Solid CO₂ (dry ice) pellets as a means of cooling during meat mincing. Better product appearance and faster meat throughput are the improvements predicted. The colder environment and bacteriostatic effect of the CO₂ gas, evolved from the sublimation of the dry ice pellets, was expected to achieve a significant shelf life extension. Trials at the Key Markets, Ilford, Essex, food processing plant have proved the validity of these claims. In practice, the free flowing CO₂ pellets, at a temperature of -79 C, were easily added to the mixer/

grinder giving an immediate temperature reduction. As the fat content was colder, smearing over the red meat was lessened with consequent improvement in appearance and production rate.

(*Food Trade Review* 52(2); 1982; 62)

PROCESSED PRODUCTS

109 Thriposha production

Thriposha is a mixture of 40% corn/soy (70:30) extruded from local grains and 60% imported Instant Corn Soy Milk. A formulation change for Thriposha, consisting of adding Non-Fat Dried Milk to the formula to reduce the Instant Corn Soy Milk component has been proposed. The proposed formula would be 51% Instant Corn Soy Milk, 9% Non-Fat Dried Milk and 40% extruded maize and soy beans.

(*LEC Newsletter* 7(1); 1983)

110 New soy product of Costa Rica

Productora Costarricense de Alimentos, began production of a new soy-fortified corn flour called Masarina for distribution to schools and health centers where pregnant and lactating mothers and pre-school children receive this and other products. The Masarina can be used in a variety of local recipes including: Masas (flour), Palitos de queso (cheese stick), Tortas de carne (meat pies), Arepas (thick corn cakes), Tortillas, Pupusas (soft taco), Empanades (vegetable pies), Rosquillas (dough-nuts, Tamal asado (baked corn pie), and Albondigas (meat balls). To obtain the required consistency, the soybeans are first extruded on the Brady between 138 C and 143 C to inactivate the trypsin inhibitor and enzyme systems. This soy is then mixed with corn (6%/94%) and extruded again at about 121 C to partially precook the corn in the blend. The blend is then ground into a flour using a Hammer Mill with a 60 mesh screen before packaging into 2.5 kg. plastic bags.

(*LEC Newsletter* 7(1); 1983)

EQUIPMENT AND MACHINERY

111 Conveyor and processing belts

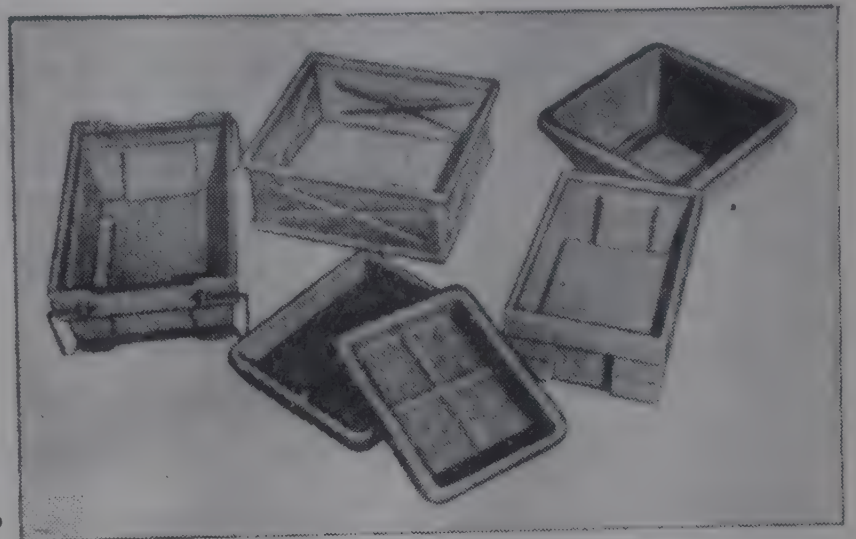
Seigling of Fed. Republic of Germany manufacture the Transilon belts for

light material handling applications in bulk and package conveying, carrying goods up/down an incline, magnetic conveyors, curved belts, elevator belts, and food processing. Available in 75 types, the belt consists of a fabric with warp and weft threads of polyester coated with PVC, polyurethane, or silicone rubber. It has stable dimensions and is longitudinally flexible and laterally stiff, lightweight and of high tensile and tearing strength.

(*Industrial Products Finder* 11(5); 1983; 63)

112 Industrial tray

Sintex all-purpose tray comes in six sizes from 35 x 35 cm to 49 x 48 cm and is meant for handling and transportation, particularly on assembly line, of small articles. By means of these trays products that can be handled are: diodes, resistors, etc. in electrical/electronic industry; biscuits and fruits in food processing; and tobacco and cigarette packets.

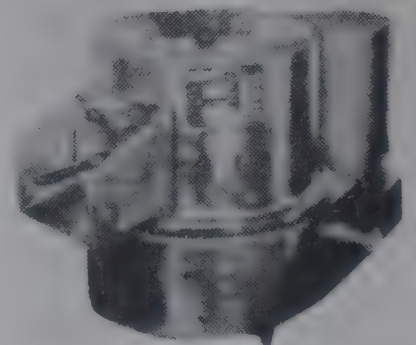


(*Industrial Products Finder* 11(3); 1982; 12)

113 Potato peeler

Metlab offers a potato peeler with 100 to 150 kg/hr capacity. Made of aluminium castings, the machine has an 0.5 HP motor and works on single/3 phase supply. A stainless steel revolving disc peels the potatoes, which can be taken out from the window provided on the side. Water connection is necessary at the time of peeling. The potato skin and water are drained through the 1.5 BSP drain connection provided.

(*Industrial Products Finder* 11(2); 1982; 101)



114 A pricking machine for aonla preserve

Indian gooseberry preserve (Aonla-murabha) is not only a delicious

food having nutritional value and vitamin-C, but also have an immense medicinal importance. The total production of all the preserves in India is around 4,000 tonnes of which aonla preserve may be around 1500 to 2000 tonnes. For making murabba the aonla fruit is pricked with silver or wooden or stainless steel needles. It has been noted on an average only 16 kg of aonla is pricked in 8 hours. A hand-operated pricking machine has been designed and fabricated for the first time. The components of the machine are made of mild steel, stainless steel, aluminium and wood. The total weight of the machine is about 8.5 kg. The length and width of machine is 62 and 29 cm respectively.

The machine pricks 80 kg of gooseberry in a period of 8 hours against 16 kg by hand pricking in conventional/traditional method. The cost of fabricating the machine comes to about Rs. 500.

(*Indian Horticulture* 27(2); 1982; 17)

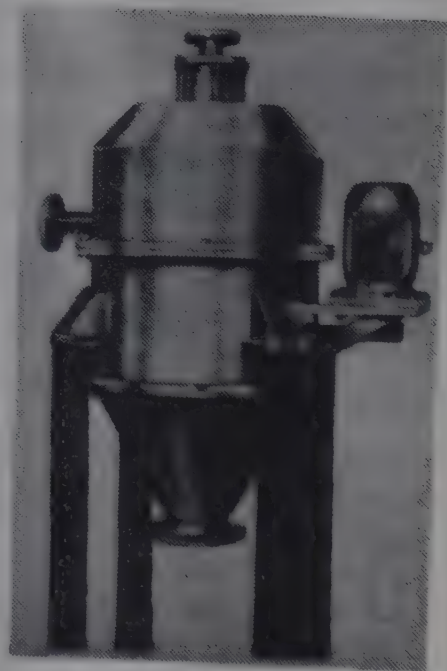
115 Extruder

Argus manufacture a 50 kg capacity vertical extruder for insecticide, pesticide and food industries. A variety of dough can be extruded to noodles of 0.8 to 2 mm dia. All parts are made out of stainless steel. The extruder shaft can be removed for cleaning. Screw-feed can be supplied optionally.

(*Industrial Products Finder* 11(1); 1982; 29)

116 Continuous filtering centrifuge

Consolidated Instrumentation have developed the JB-II filtering centrifuge, in which the slurry inlet, liquid outlet and solids outlet are fully continuous. The unit generates a maximum G force of 1,800, but higher G forces can be provided. Typical capacity is 5-6 tonnes/day of solids based on 50% inlet slurry concentration. The unit weighs 300 kg including motor and works on 3 HP. It does not need any special foundation and can be installed on structural supports. The slurry enters a rotor assembly at the top. Liquid is thrown out tangentially across the filtering media, which is



a perforated mesh, filter cloth or a combination of these, and is collected in the liquid chamber from where it comes out continuously through the liquid outlet nozzle. Solids are gently moved down through the rotor and are collected in the bottom conical collector. They leave the collector continuously through the bottom nozzle which can be coupled directly to conveyors, etc.

(*Industrial Products Finder* 11(2); 1982; 79)

117 Filter unit

Stainless steel single and multiple filter units, completely made of stainless steel and fitted with filter cartridges, are offered for removing a variety of particulate matter, colloidal impurities, and bacteria from water, air, gas, solvents, chemicals, etc. The single filter unit can give flow rates from 1,000 l/hr to 300 l/hr depending upon the grade of the cartridge used. The multiple filter unit can be fitted 3,4,5 or 7 cartridges for flow rates ranging from 7,000 l/hr to about 2,000 l/hr. The cartridges are available from 150 micron to 0.1 micron, and can be reused after cleaning with a plastic brush. But they will have to be replaced after their filtration life. The maximum working pressure of the unit is about 6 kg/cm^2 , and normal operating pressure 4 kg/cm^2 .

(*Industrial Products Finder* 11(Annual Number); 1982; 146)

118 Solids blender

Solids Blender - called the Ultra-Flow - combines the design advantages of the double cone and v-shaped blenders. The combinations results in a double in, double out, back and forth blending action, allowing a more precise blend in difficult or critical blending applications. It is said that the greater surface to volume ratio increases particle mobility; therefore, blending times may be reduced by as much as 60-70%. Ultra-flow slant-cone blender shells are available in carbon steel and stainless steel, with all internal vessel welds ground flush and smooth. Batch capacities range from $1\text{-}500 \text{ ft}^3$. Optional features include a cantilever internal agitator, an airless spray system for liquid feed, dust-tight spherical control valves, automatic drum loading systems,

weighing scales, and a variety of motor drive and electrical control features.

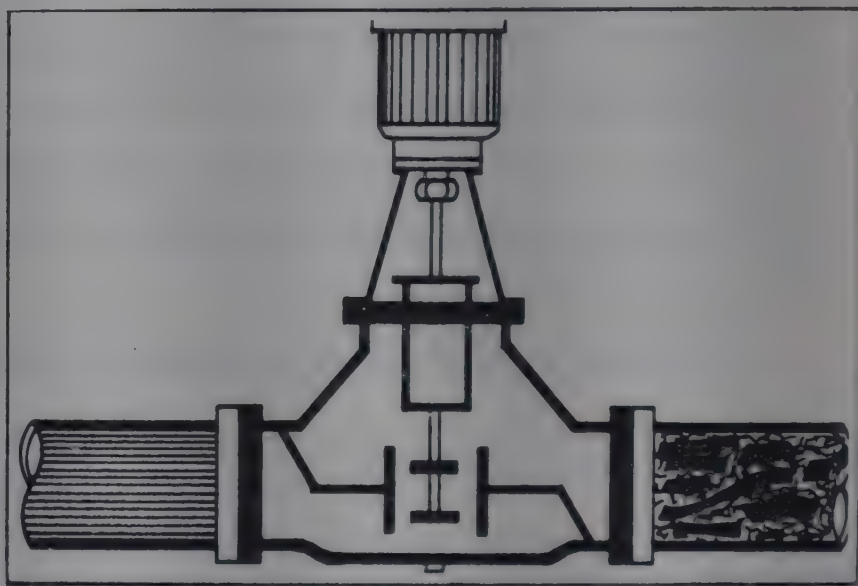
(PFNDAI Newsletter No.1; 1983; 3)

119 Mixer

Trimurti Associates manufacture a sigma mixer for kneading, mixing, and homogenising highly viscous compounds. The mixer is available in capacities ranging from 25 to 600 kg. The sigma blades are integral with shaft ensuring positive mixing and kneading operation. The mixer is available in constructions such as MS, and SS 316 and 304, with/without heating/cooling jacket and tilting arrangement for unloading the charge. (Industrial Products Finder 11(Annual Number); 1982; 347)

120 In-line mixer

Dalal Engineering offer an in-line mixer for mixing liquids, solids and liquids, or gases and liquids at operating pressures up to 150 PSI. The unit features variable speed drive for speed adjustment, built-in tramp material trap, and quick opening for fast and easy cleaning. Typical applications are detergent de-lumping ahead of spray driers, dispersing colour pigments, intimate mixing and de-lumping of asphaltic materials, grinding in liquid suspension and mixing/dissolving of solids in liquids/pastes in a number of processes.



(Industrial Products Finder 11(3); 1982; 2)

121 Blender

Fabdecon V Blender is an outgrowth of the simple cylinder formed by two opposed sections. It reportedly creates additional mixing action at the centre and produces uniform solid-solid and solid-liquid blends with virtually no attrition to sensitive particles. As the material is

rotated close to the axis, power requirement is reduced. The blender can be used for blending fragile cereals and snack foods, insecticides, etc. Other operations include gentle blending, liquid dispersion in solids, solid-solid coating, liquid-solid coating and agglomeration of solids. The blender comes in capacities ranging from 10 to 2,000 litres, and is constructed in carbon steel, stainless steel of all grades, alloy, steel, Hastelloy, etc.

(PFNDAI Newsletter No. 46; 1982; 3)

2 Mincing machine

Metlab offer a heavy duty mincing machine suitable for hotels, industrial canteens and hospitals. The machine has a drive of 1.5 HP and operates on 3-phase 440 VAC. It can be used for mincing meat, fish, vegetables, etc. at 60 kg/hr. All the contact parts are made of stainless steel.

(PFNDAI Newsletter No. 46; 1982; 1)

23 Crystal grinding machine

AEW offer the Sweenish pin mill for grinding purposes in chemical, confectionery and ice-cream industries. The machine can be adjusted to achieve the required fineness, from coarse granulation to fine powder. The grinding operation is effected by beating, shearing, crushing and auto-collision of the material. It is gradually done from the centre to the periphery of the rotor, allowing heavy pieces of material to be reduced, by stages, to the fineness required. The material to be ground is fed automatically in the centre of the rotor by a mill hopper provided with oscillating sifter. Of cast iron with epoxy coating, the pin mill works on 1.5 HP.



(Industrial Products Finder 11(3); 1982; 27)

24 Sieve/grading machine

Dandekar Brothers offer an eccentric sieve and grading machine for processing foodgrains, groundnut, pulses, etc. The machine can also be

employed for grading tobacco and other materials. Processed stuff is delivered at three outlets for bagging. A self-contained portable motorised unit, the machine can be suitably manoeuvred in a big godown or even in factory. It is provided with wheels on the frame for easy movement.

(Industrial Products Finder 11 (Annual Number); 1982; 197)

125 Multi-purpose food processor

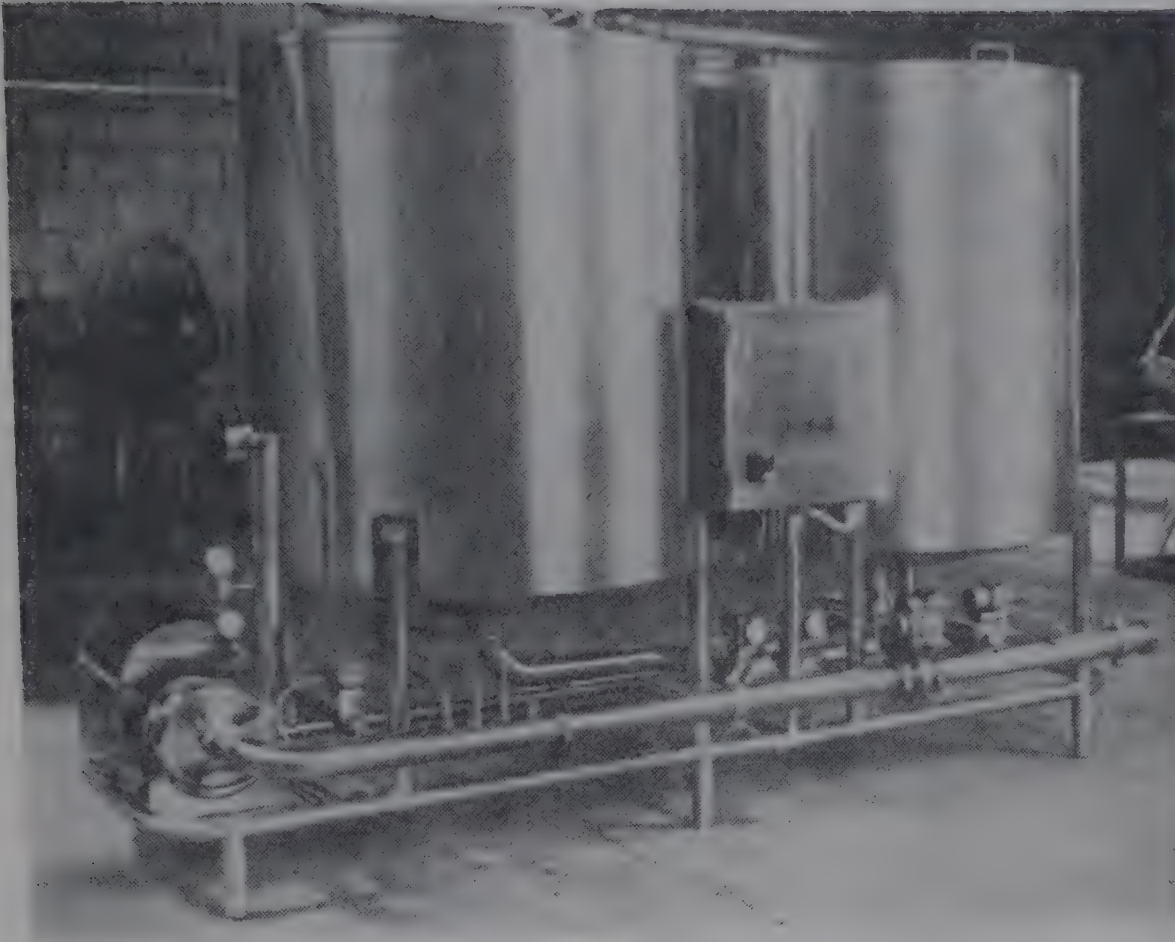
A multi-purpose food processor, designed and developed by the Bangalore-based Lektrix Engineering Industries. With just four blades, the new appliance claims to perform 30 operations such as kneading chapati atta, wet grinding, mincing, slicing, shredding, egg beating, etc. A special attraction for the user is that the machine, unlike conventional mixers and grinders, is noiseless.

(Seminar Reporteur 12 (9); 1982; 9)

126 In-place cleaning of process equipment

This is useful for the brewing, dairy, soft drinks, wine, food, distilling, pharmaceutical and allied industries. A new series of stainless steel CIP (cleaning in-place) equipment for the automatic internal cleaning of pipelines, tanks and associated process equipment has been introduced by Diversey (Europe) Limited, 1/11 Hay Hill, London W1X 7LF, England. Standard units (typical mid-range example shown in Fig.1) include single-use, multi-use and re-use systems with tank sizes of 500, 1000, or 1500 litre capacity and valve sizes of 2, 3 and 4 inches (50 mm, 75 mm and 100 mm).

The equipment, which is microprocessor controlled, is of modular construction. Because the tanks for holding water and cleaning solutions are cylindrical rather than rectangular, they require no internal bracing and are therefore crevice-free. The tubular steel frame serves as a protective conduit for electric wiring and pneumatic hose. Components such as valves and pumps can be chosen by the customer. The design is compact - the smallest unit occupies only 1 m x 1.6 m floor area. Those components requiring periodic maintenance are positioned for ease of access. There are local controls on each unit, but the CIP microprocessor control unit can be remotely located.



(Newsletter from EIBIS International)

127 Cookstoves for the masses

The improved cookstoves with fire-grates give higher values of combustion temperature (737 C) and thermal efficiency (15.77%) than ordinary chulas.

The reason for improper combustion of fuel in the traditional chula is the availability of insufficient air. This problem has been solved by providing fire-grates in the combustion space and by raising the platform with the help of a suitable stand to make room for air to enter and reach the fuel from below also. In the modified chula (Fig.1) the air passes from the bottom to the top while the combustion is in progress, and hence even the lowermost layers of fuel get sufficient air for

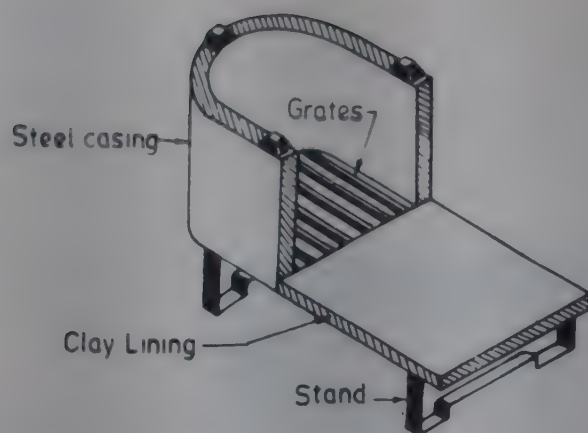


Fig. 2. The improved chula with fire-grates (portable)

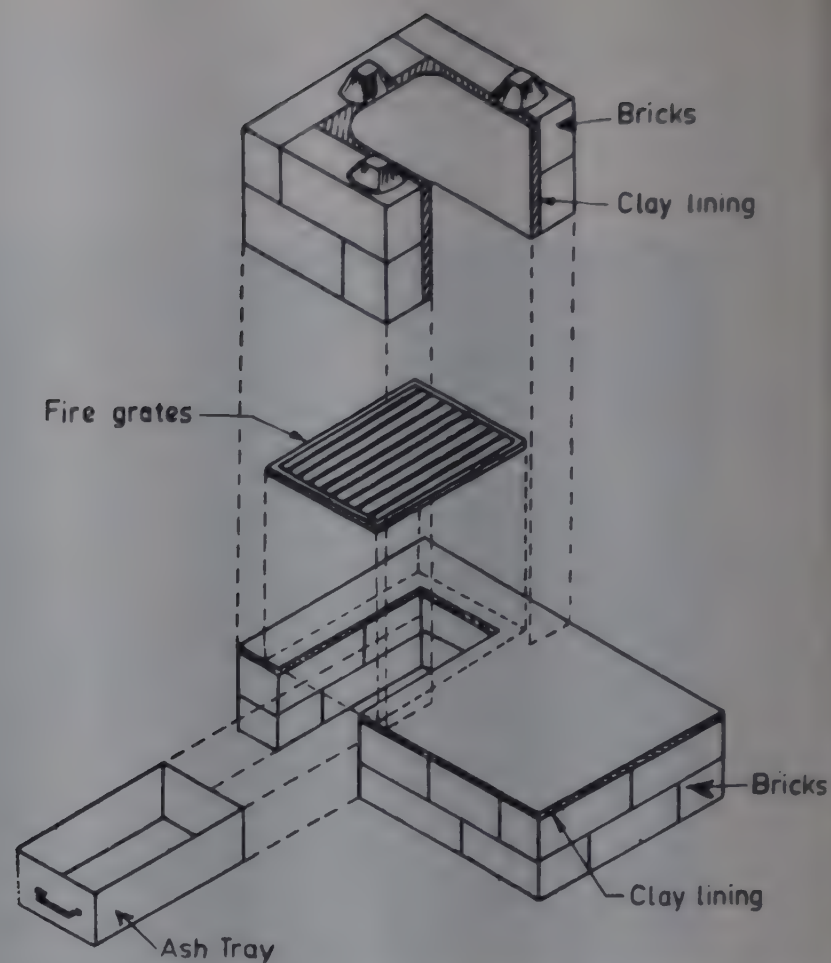


Fig. 3. Exploded view of the improved chula (non-portable).

combustion. This design improvement not only increases the rate of fuel combustion but also reduces the quantity of smoke produced in the kitchen; hence, it produces a cleaner and healthier atmosphere in the kitchen. The ash of the burnt fuel falling down through the fire-grates can be removed directly from the floor or collected in a tray placed underneath.

The improved chula is made of mild steel sheet, just like the existing design, but the fire-grates are made of mild steel rods or bars. It is also portable. A non-portable chula with fire-grates can be made as usual with the help of bricks and clay, except that the fire-grates will have to be fabricated by welding or rivetting mild-steel rods/bars into a rectangular form to be placed over the fire space. An exploded view of such a chula is shown in Fig. 2. The walls, the combustion space and the bottom are lined with fire clay and an ash tray is provided for removing the ash.

Table 1. Performance of improved chula with fire-grates

Types of cookstove	Diameter of combustion space (mm)	Maximum combustion temperature (C)	Thermal efficiency (%)
1. Chula	240	678	12.3
2. Chula with fire-grates	240	737	15.77

A solar cabinet dryer

Central Arid Zone Research Institute, Jodhpur, has fabricated a solar cabinet dryer. The drier is essentially a solar hot box in which fruits, vegetables or other things can be dehydrated on a small scale. In essence it consists of a rectangular wooden box made of wooden planks (25 mm thick) with a base area of 1.5 sq.m. insulated at its base and covered with a clear window glass at a fixed inclination of 23 degrees from horizontal. Holes are drilled in the base to permit fresh ventilating air entry into the box. Outlet holes are located on the upper parts of cabinet side and rear panels so that the humid warm air can escape through the upper side holes thereby creating a partial vacuum and inducing fresh air from the holes in the base. As a result there is a constant perceptible flow of air over the drying material, which is placed on perforated trays on the interior cabinet base. With this dryer 15 kg of chillies, and 15 kg. of dates were dehydrated, 15 kg of grapes were converted into raisins within 2 to 4 days at Jodhpur. (*Documentation Bulletin No. 49; 1982; 15*)

2-step solar cooker

The National Institute of Oceanography has developed a box type solar cooker measuring 50 cm x 50 cm x 35 cm and weighing 35 kg. The unit is provided with 2 shelves and four black-anodised Hindalium containers for cooking. Soft food items like fish, rice, etc- can be placed on the lower shelf while hard items like pulses are placed on the upper shelf. It takes on an average about 1½ hours to cook 700 g of rice and pulses at a time.

Some of the salient features of the cooking device are: 1. All the components are of indigenous material and even rural artisans can fabricate the cooker; 2. It is portable; 3. It is capable of cooking most of the common food; 4. The cooker can be used in co-ordination with conventional devices which do initial frying and the rest can be done by the cooker, thereby conserving fuel.

This solar cooker, costing approximately Rs.300/- each is convenient particularly for field workers.

(*NTD Newsletter 4(1); 1982*)

130 Tray dryer

Argus manufacture 5 models of a tray dryer - 12, 24, 48, 96 and 192 trays - for drying chemicals, dyestuff, pharmaceuticals, foam rubber, pesticides, leather, etc. in the temperature range of ambient to 300 C. Cross flow air circulation is effected by means of blowers kept on the sides to maintain uniform temperature. Heating is by either steam coils or Escorts electrical air heaters or both. Adjustable dampers are incorporated for air intake and exhaust. Trollies are provided for accommodating 48 aluminium trays of size 80 x 40 x 3 cm. each. The dryers are insulated with insulation wool and asbestos gasket. A separate control panel houses indication lamps, starter, contactor thermostat and temperature indicators.

(*Industrial Products Finder* 11 (Annual Number); 1982; 193)

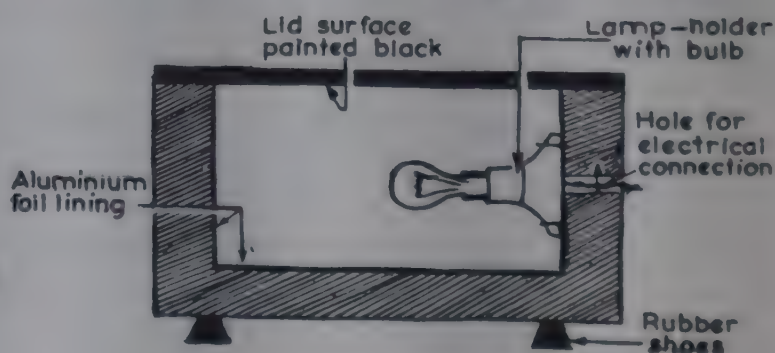
131 Self-heating can

A self-heating can likely to be of great interest to skiers, campers, and military personnel in all countries, was presented by a Swiss at an International Exhibition of Inventions in Geneva during February. It is a food can, fitted with a built-in heating device, based on a gasless and odourless slow-burning chemical element. A pull on a small tab is all that is needed to set the chemical process in motion and the food in the can is hot in 3 min.

(*PFNDAI Newsletter* No. 5; 1983; 2)

132 Food warmer

A simple, handy food warmer that can be used to toast bread, make biscuits crisp, heat small quantities of water for shaving, etc. has been developed. It can be made using a wooden box of 200 mm length, 100 mm width, and 120 mm height, opened at the top and with a hole drilled in the side wall to fix a 60w bulb with holder (see sketch). A lid of aluminium sheet is fitted at the top



of the box in such a way that it could be easily removed to replace the bulb. The entire box is lined inside with aluminium foil except the inner surface of the lid which is painted black with Indian ink. To avoid excess heating, three holes of 3 mm diameter are drilled on either side of the box. Four rubber shoes are fitted at the bottom.

(*Invention Intelligence* 16(12); 1981; 515)

33 Hot cabinet

Metlab manufacture hot cabinets for hotels, hospitals, industrial canteens and chemical units. The standard size is 121.92 x 60.96 x 121.92 cm. The top is of stainless steel. The outside panelling is of MS elegantly painted, and inside of aluminium. The cabinet is provided with 2 KW heaters and thermostatic control and can be connected to 230 V single phase supply.

(*Industrial Products Finder* 11(Annual Number); 1982; 391)

34 Pilot plant for beverages

Pilot plant carbonates and bottles or cans samples of beer, soda, or process champagne in 5-gal batches. The equipment may be used to produce numerous test batches with varying levels and sources of carbonation. It may also be used to evaluate the effect of changes in syrups, extracts, flavours, formula, and container type or composition. The stainless steel pilot plant is lightweight and compact. It consists of filter, pressure relief valve, gauges, and a separate attachment for bottling and canning.

(*PFNDAI Newsletter* No. 1; 1983; 1)

135 Soda delivering machine

A new electronic automatic soda fountain machine has been developed by Mr. Ganpat Solanki of Kolhapur. The electronic device in the machine is so well equipped as to get adequate supplies of soda as soon as a glass is put into the machine. The storage of water mixed with carbon dioxide is electronically linked with automatic operations in the machine. One can very easily put the glass into the space in the machine without touching it and get soda poured into it. The machine is being marketed by Gakso, Refrigeration Engineers, 249 E, Nagala Park, Kolhapur-416 003 (Maharashtra).

(*The Economic Times*, January 25, 1983; 7)

PACKAGING

136 Automatic bag maker

Kolsite Industries have developed a high speed automatic machine for making all types and sizes of bags for LDPE, HM-HDPE, PP, etc. The machine can be used for the production of both side-weld and bottom-weld bags up to 860,000 bags/day. The sealing width is 780 mm and minimum and maximum draw lengths are 100 mm and 700 mm, respectively. The machine can be operated from 50 to 150 strokes/minute depending upon the stroke length. It features two centre slitters and pay-offs to produce simultaneously four bags in small sizes and two bags in larger sizes; counter with hooter; and photo-cell for printer bags. Attachments optionally offered include bottom gusset, flap making, lip making, etc.

(Industrial Products Finder 11(3); 1982; 17)

137 Nitrogen gas packing machine

A semi-automatic machine is offered to flush nitrogen gas into the containers of those powdered materials which deteriorate fastly in the presence of oxygen. The operator punches the bottom of each container, puts them all into a tray, and inserts it (tray) into a chamber. The chamber door on being closed triggers a circuit. The circuit first allows the air to be sucked from the chamber area followed by the air bubbles in the powdered material. When the resultant vacuum reaches the desired level, nitrogen gas is let into the chamber. The air pockets and space in the containers are thus filled with nitrogen gas. On completion of this 3-minute process, the chamber opens automatically. The tray is then pulled and the container bottoms are soldered. A panel board indicates each operation by indicating bulbs. Twenty-four tins of 500 g, 12 tins of 1,000 g or 4 tins of 10 kg each can be handled in the packing machines at a time.

(Industrial Products Finder 11(Annual Number); 1982; 171)

138 Liquid filling machine

The NES range of volumetric liquid filling machines is designed particularly for use in bigger packing of free-flowing liquids such as pesticides, mineral oil, vegetable oil, etc. The range includes machines with

hourly output rates of 1 litre-500 tins, 5 1-250 tins, 16 1-100 tins, and 200 1-20 drums. The principle of filling is based on pipette system. (*Industrial Products Finder* 11(3); 1982; 32)

39

Powder filling machine

The VAF 40 is a volumetric powder filling machine for a variety of powders such as milk, curry, medicinal products, and bleaching and other abrasive powders. The speed and quantity can be adjusted by a control box, which incorporates a sophisticated timer. The filling range is from 100 g to 10 kg by volume. The speed is 40 one kg tins/minute. The VAF 40 is suitable for non-free-flowing powder. A filler for free flowing powders can be supplied. The model features 3 pre-lubricated main bearings to minimise lubrication botheration. The power flowing-way is installed in such a manner as to enable easy cleaning. All material-contacting parts are of SS. Continuous dosing, vibrator and the bowl around the feeding screw are optional items. The bowl can be of SS/glass. The powder level is maintained by means of a micro-switch. A synchroniser can also be supplied to feed empty tins. It collects tins, presents them to the machine, waits for the filling, vibrates the filled tins to settle the powder and passes them on to the conveyor for further process. Also offered are weight fillers for free-flowing and non-flowing materials. (*Industrial Products Finder* 11(Annual Number); 1982; 55)

140

Filling and capping machines

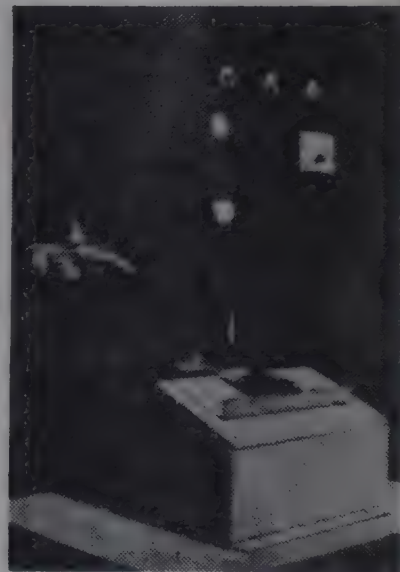
Autopack have developed automatic filling and capping machines for liquid/powder filling at the rate of 60 to 120 bottles, a minute. Auto-Kap Model AC 6 is a 6-head rotary machine that places and tightens the pre-threaded caps on bottles of any size/shape. The tightening torque can be adjusted to ensure leak-proof capping. A vibratory/rotary type hopper controls the infeed of caps on to the bottles. Along with the capping machine, the filling machine can be used to make a complete automatic line for filling and capping together. These machines can also be supplied separately. A feature is that the capping mechanism will not work unless the bottle presents itself. The bottle feeding is timed to be smoothly discharged to the output conveyor. Bottle guides and parts coming in contact with the content are made of stainless steel to avoid contamination. (*Industrial Products Finder* 11(1); 1982; first cover)

141 Thermoform/fill/seal machine

Thermoform/Fill/Seal Machine - the Model 2500 Champion - may be used to package processed meats, cheese and other foods in vacuum-sealed packages. The machine automatically forms, fills, and seals up to 500 packages/min. on one, continuous operation. A product cavity measuring 14-in x 17¼-in and up to 5-in deep, may be used for thermoforming a single package or may be divided for multiple packages in a variety of product sizes and shapes. After forming, the packages are filled and the top laminate is heat-sealed as air is evacuated to complete the packaging operation. Packages can be made of film, foils, or laminated materials.
(PFNDAI Newsletter No. 1; 1983; 2)

142 Pneumatic sealing machine

Johnston Automation have developed an automatic machine for sealing plastic and polyester pouches at 3 sec/pouch after they are filled with solids and liquids, eatables and drinks. The machine incorporates facilities for automatic clamping, evacuation of air, nitrogen filling and automatic sealing. The process is synchronised through electronic timers, solenoid valves, pneumatic cylinders, and automatic temperature control and other devices. Cycle timings can be set by means of the timer depending on the type of pouches to be sealed.
(Industrial Products Finder 11(3); 1982; 105)



143 Heat sealer

The Quazar Lab-Sealer is a self-contained, pneumatically-operated sealer that is suitable for heat sealing coated or laminated paper, glassine, cellophane, polyester, aluminium foil, etc. The temperature of both the sealing bars is separately infinitely adjustable. Thermocouple sensors are used for temperature control.



The sealing time is controlled by an electronic stepless timer for repeated operation. The vertical movement of the upper bar is pneumatically operated. The desired speed and pressure are controlled by individual valves and air filter regulator. The standard sealing bars are smooth and the sealing area is 300 x 5 mm.

(Industrial Products Finder 11(3); 1982; first cover)

144 Conveyor with cleaning unit

Prod-Aid have developed a packaging line conveyor with cleaning unit, primarily for food and pharmaceutical industries. A quick release unit, fitted at the end of the conveyor, enables the endless PVC belting to be lifted completely clear of the deck for cleaning. After cleaning, the end unit is simply pressed down and the belt becomes tensioned again. The conveyor sections are manufactured for standard belt widths of 150, 200, 250 and 300 mm and lengths in multiples of 2,400 mm. Electric and drive unit is housed inside a panelled box. Optional features such as built-in top-laminated or steel table allow clear leg room for packers.

(Industrial Products Finder 11(Annual Number); 1982; 263)

145 Apple juice in compact cartons

Apple juice from Himachal Pradesh now sold in cans and bottles, all over the country, will arrive in compact, aseptic cartons soon. It will be for the first time in India such cartons will be used for packing fruit juices. HMPC is going in for tetra brick juice filling system, which involves aseptic filling of fruit juice and fruit drinks in cartons, for packing apple juice. The cartons cost less than cans or bottles, and the tough container provides an excellent barrier to gas and light, thereby increasing the shelf-life of the product.

(Hindu March 27, 1983; 6)

146 TPL film overcomes frozen meat packaging problems

A new laminated film material has been developed and test marketed by Transparent Paper Ltd of Bridge Hall Mills, Bury, Lancs BL9 7PA. Called Dioplex PI, the film is permeable and keeps meat a fresh red colour by allowing oxygen to the product, without which meat is prone to darken-as when vacuum packed - and become unattractive in freezer cabinets.

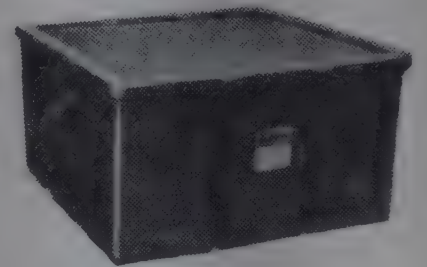
In developing this permeable film, TPL overcame the technical difficulties of machining Surlyn inomer resin film on both top and bottom webs of an automatic form/film seal machine with all-over seal capability. The system combines a bottom web of Surlyn with a top web of Dioplex, which TPL handle exclusively in the UK. Dioplex packed meat stays attractive in colour - a significant sales aid - is not obscured or damaged by freezer burn or frosting and stands up well to handling in sales cabinets. Additional to its permeable qualities, the film is machineable, printable, freezable, puncture resistant and has a gloss to highlight pack design and printing.

(*Food Trade Review* 52(2); 1982; 75)

147 Multi-purpose stackable box

Sinter Plast Containers offer a one-piece moulded, multi-purpose HDPE (5 mm thickness) box, which can be stacked with lid or strapped/sealed. The box's external dimensions are 55 x 55 x 32.5 cm. Applications include handling and transportation of textile cones, as well as ampoules, vials, tablets, and syrup bottles. It also finds applications in food processing, fisheries, cosmetic and tyre industries.

(*Industrial Products Finder* 11(2); 1982; 99)



ANALYSIS

148 Continuous density measurement

A new low cost continuous density monitor that is suitable for food processing applications which do not require the highest accuracy is now available from Laboratory Implex Ltd of Lion Road, Twickenham, Middx.

The LB365 uses a non contacting measuring principle to determine the density of feed products such as sugar solutions of milk in a variety of configurations depending upon the sensitivity required and volume of product. Normally the instrument's low intensity emitter and high sensitivity detector are attached to the outside of a pipe and carefully aligned so that they are diametrically opposite. However, where a higher sensitivity

is required, they can be aligned along the axis of a pipe or alternatively, where large volumes are involved the emitter can be immersed in a tank and the detector attached to the outside of the wall.

Very low intensity radiation is emitted from the shielded source unit and passes through the solution in the pipe or vessel. Since the path-length and intensity are constant, any changes in signal strength reaching the detector are due to changes in density of the product. A readout is then available from an associated electronics amplifier/readout which can be positioned a considerable distance from the detector.

(*Food Trade Review* 52(1); 1982; 15)

49 Test to detect purity of water

The Defence R and D establishment in Gwalior has come with a simple field kit for detection of coliforms in water based on principle of association. The test is based on production of ferric sulphide by hydrogen sulphide, which turns water black in colour. The medium is made of peptone, dipotassium hydrogen phosphate, ferric ammonium citrate, sodium thiosulphate, Teepol and water. One ml. of this medium is absorbed on folded tissue paper (80 cm²) which is placed in a bottle, sterilized and dried at 50 C. Water samples have to be added to this bottle for testing and allowed to stand at room temperature (30-37 C) - if it is polluted the colour turns dark within 12-18 hr.

(*The Hindu* February 2, 1983; 18)

150 Rotary viscometer: precise measurements

An entirely new instrumental technique for precisely measuring the viscosity of liquids is the basis of Rotary B viscometer. Viscous torque (shear stress) on an immersed spindle is measured as the analog of the current required by the armature of the motor to rotate the spindle. Classical flow curves are recorded, as are, for the first time, viscosity/shear rate curves. A feature of the new technique is an extended viscosity range. Instrument has been developed over 8 years as a superior general purpose unit.

(*PFNDAI Newsletter* No.5; 1983; 2)

151 Low-level viscosity measuring instrument

Low-level absolute viscosities may reportedly be determined using the Model 7.010PBD viscometer. In operation, a 3.2 cm stainless steel sphere is immersed into the liquid which is to be measured and oscillates about its polar axis with an amplitude precisely held to 2.5 μ . More power is required to maintain the amplitude when the liquid is more viscous. The viscometer provides instant display of absolute viscosities for very thin liquids such as alcoholic beverages. Six push buttons allow the operator to select from six viscosity ranges covering 0.1-1 million cp.

(*Food Technology* 37(2); 1983; 90)

152 Flowmeter

Nitto Seiko Co. Ltd. of Japan manufacture a flowmeter for flow measurements of cold and hot water, light and heavy oil, liquid chemicals, waste water, liquid food, etc. Flow measurements can be done under a range of pressures, temperatures and viscosities with mechanical preset counter, set-back register, pulse generator for DC conversion, indicator with totaliser, indicator with alarm, recorder, controller, digital indicator and other options.

(*Industrial Products Finder* 11(Annual Number); 1982; 16)

153 Oscillating granulator

PEE have developed an oscillating granulator with guards on the hopper and the discharge end to prevent the material from flying. The granulator features variable pulley arrangement to suit different types of products and for avoiding fines; and perforated stainless steel sieves to avoid contamination. It can be used for granulating variety of powders before compression in a particular shape as well as for pulverising or braking rejected tablets.

(*PFNDAI Newsletter* No. 42; 1982; 1-2)

54 Retort processing indicators

Retort Processing Indicators - called Cook-Chex^(R) - which help to assure compliance with the prescribed cooking cycle, are described in the "Product Bulletin No. 511-570". The indicators are heat-sensitive devices which turn green when exposed to saturated steam for a specific time at a specific temperature. By its failure to turn green, the indicator signals that a possible malfunction has occurred in the process, and it alerts quality assurance personnel to check for a possible error in the process time/temperature or a malfunction in the equipment. The indicators, which may be used with all still cookers, come in 15 different chemical formulations, each designed for a cook with a specific time/temperature combination.

(PFNDAI Newsletter No.1; 1983; 1)

155 Easy protein tester

Pacific Scientific who recently acquired the Neotec Corporation has launched the Model 101 cereal grain analyzer. According to the company no special skill or training is required for operation. Once the grain sample is ground, it is placed into the instrument and eight seconds later per cent protein and moisture are digitally displayed. The Model 101 is available in a Model 101B version with capability of up to sixteen independent grain calibrations. The Model 101B provides sunflower, as well as, wheat, barley and a variety of other product analyses.

The Model 101 allows you to segregate incoming grains by protein and moisture levels, differentiate between malting and feed barley, holding control during blending process, reduce reject shipments and analyze sunflower for oil content.

(Milling Feed and Fertilizer 165(8); 1982; 41)

156 Electronic milk tester

A milk tester from Rajasthan Electronics and Instruments Ltd. of Jaipur, meant for small milk producers, gives a digital readout of the percentage of fat content accurately. This enables quick and correct payment to farmers.

(Hindu, April 13, 1983; 19)

COMMERCIAL INTELLIGENCE

PRODUCTION (RAW MATERIAL)

All India final estimate of ragi, 1981-82

State	Area (Thousand hectares)	Production (Thousand tonnes)
Andhra Pradesh	265.0	291.5
Bihar	170.9	94.3
Gujarat	47.4	48.7
Himachal Pradesh	10.6	7.8
Karnataka	1,123.2	1,440.1
Kerala	1.4	1.1
Madhya Pradesh	20.6	5.3
Maharashtra	225.2	228.0
Orissa	308.5	250.6
Tamil Nadu	250.1	382.3
Uttar Pradesh	167.1	149.6
West Bengal	16.8	9.7
Dadra & Nagar Haveli	3.0	3.6
Goa, Daman & Diu	6.4	9.3
Pondicherry	1.4	4.5
All India	2,617.5	2,926.4

- Fully revised estimates for Andhra Pradesh, Bihar, Madhya Pradesh, Orissa, Uttar Pradesh, West Bengal, Goa, Daman & Diu and Pondicherry and final/revised estimates for others.

Notes : No information regarding crop estimates is yet available from Govt. of Sikkim.

States/Territories not mentioned above do not grow ragi to any appreciable extent.

(Agricultural Situation in India 37(5); 1982; 357)

58

All India final estimate of tapioca, 1981-82

State	Area: '000 hectares Production: '000 tonnes	
	Area	Production
Andhra Pradesh	14.6	110.6
Assam	1.5	6.7
Karnataka	1.3	12.8
Kerala	241.8	4,073.0
Meghalaya	3.8	19.7
Nagaland	0.2	1.1
Rajasthan	0.3	0.5
Tamil Nadu	42.3	1,324.8
Tripura	0.3	1.3
Andaman & Nicobar Islands	0.2	1.6
Arunachal Pradesh	3.2	6.8
Mizoram	0.3	1.0
Pondicherry	0.4	7.5
All India	310.2	5,567.4

Notes : 1. Tapioca is not grown to any appreciable extent in States and Union Territories not mentioned above.

2. No information regarding crop estimates is yet available from the Government of Sikkim.

(Directorate of Economics and Statistics, Ministry of Agriculture, Government of India. New Delhi)

159

All India final estimate of safflower 1981-82

State	Area (Thousand hectares)	Production (Thousand tonnes)
Andhra Pradesh	35.8	7.3
Bihar	0.3	0.1
Karnataka	175.4	89.0
Madhya Pradesh	0.9	0.2
Maharashtra	542.2	324.4
Orissa	6.0	2.8
All India	760.6	423.8

(Agricultural Situation in India 37(6); 1982; 432)

160 All India final estimate of nigerseed, 1981-82

State	Area (Thousand hectares)	Production (Thousand tonnes)
Andhra Pradesh	10.3	3.6
Bihar	45.8	16.9
Karnataka	53.7	9.3
Madhya Pradesh	224.9	40.8
Maharashtra	101.0	24.1
Orissa	137.2	57.6
Dadra & Nagar Haveli	0.6	0.1
All India	573.5	152.4

Note: 1. Nigerseed crop is not grown to any appreciable extent in other States/Territories not mentioned above.

2. No information regarding crop estimates is yet available from the Government of Sikkim.

(*Agricultural Situation in India* 37(6); 1982; 432)

161 Likely supply, demand and shortfall of oilseeds

Year	Likely per capita consumption (kg/year)	Likely demand (lakh tonnes)	Likely production (lakh tonnes)	Shortfall (Lakh tonnes)
1981	5.40	36.2	24.73	11.47
1982	5.50	37.5	25.02	12.48
1983	5.60	38.1	25.32	13.38
1984	5.70	40.0	25.62	14.38
1985	5.80	41.4	25.92	15.48
1986	5.90	42.7	26.23	16.47
1987	6.00	44.1	26.54	17.56

(*Oils and Oilseeds Journal* 30(2); 1977; 37)

2 Higher floor price for oilseeds

The Central Government today announced increased minimum floor price for oilseeds for 1983-84 marketing season. The price for groundnut in shell will be Rs. 315 per quintal, an increase of Rs. 10. For soyabean, the price will be Rs. 230 per quintal for black variety and Rs. 255 per quintal for yellow variety. This represents an increase of Rs. 10 in both cases. For sunflower seeds the price will be Rs. 275 per quintal - an increase of Rs. 25. These prices will be for fair average quality. (Hindu July 7, 1983; 9)

63 All India final estimate of dry chillies, 1981-82

Area: '000 hectares Production: '000 tonnes

State	Area	Production
Andhra Pradesh	151.5	171.9
Assam	10.2	6.0
Bihar	10.0	11.4
Gujarat	13.5	9.3
Haryana	8.2	8.1
Himachal Pradesh	0.9	0.2
Jammu & Kashmir	1.0	0.5
Karnataka	152.3	46.9
Kerala	0.9	0.8
Madhya Pradesh	55.4	19.2
Maharashtra	145.9	74.7
Manipur	4.4	2.6
Meghalaya	1.4	1.0
Nagaland	1.3	0.9
Orissa	78.5	57.6
Punjab	8.0	9.3
Rajasthan	34.5	14.6
Tamil Nadu	72.1	54.6
Tripura	1.1	0.4
Uttar Pradesh	18.4	14.5
West Bengal	23.7	18.1
Arunachal Pradesh	0.4	0.3
Delhi	0.1	0.4
Mizoram	3.0	1.5
Pondicherry	0.1	0.1
All India	796.8	524.9

Notes : 1. The States/Union Territories not mentioned above do not grow chillies to any appreciable extent.

2. No information regarding crop estimates is yet available from the Govt. of Sikkim.

Directorate of Economics & Statistics, Min. of Agri., Govt. of India,

All India final estimate of onion, 1981-82

State	Area (Thousand hectares)	Production (Thousand tonnes)
Andhra Pradesh	14.4	121.1
Assam	3.7	8.1
Bihar	14.4	98.0
Gujarat	13.1	339.4
Haryana	1.1	13.5
Himachal Pradesh	0.7	0.9
Jammu & Kashmir	0.5	4.2
Karnataka	35.8	216.0
Kerala	0.4	2.7
Madhya Pradesh	13.3	155.1
Maharashtra	54.5	739.2
Nagaland	0.1	0.1
Orissa	51.1	308.7
Punjab	0.9	12.3
Rajasthan	10.5	32.9
Tamilnadu	26.1	267.7
Tripura	0.1	0.2
Uttar Pradesh	21.9	361.8
Delhi	0.1	0.6
Pondicherry	*	0.1
All India	262.7	2,732.6

* - less than 50 hectares/tonnes.

Notes : 1. States and Union Territories not mentioned above do not grow onion to any appreciable extent.

2. No Information regarding crop estimates is yet available from the Government of Sikkim.

(Directorate of Economics and Statistics, Min. of Agri., Govt. of India)

Beef and buffalo meat

Consumption of beef and buffalo meat at present in India is about 65,000 tonnes/year.

(Indian Food Packer 36(4); 1982; 68)

6 Rice bran oil in plenty by century-end

It is estimated that a total of 5.8 million tonnes of bran will be available for processing in 2000 A.D.

(Oils & Oilseeds Journal 34(10/11/12); 1982; 51)

EXPORT

57 Rice bran export

The Govt. of India has earmarked 4 lakh tonnes for 1982-83 as against 5.82 lakh tonnes for last year. The exports have progressively increased from 1.03 lakh tonnes in 1975-76 to 5.60 lakh tonnes in 1981-82. In the year 1981-82 the ceiling of 5.25 lakh tonne was imposed for the first time. For the year 1981-82 also a ceiling of 5.82 lakh tonnes was fixed. Now for the year 1982-83, the ceiling has been lowered to four lakh tonnes. In 1981-82, 10,000 tonnes of edible grade rice bran oil was produced, representing seven per cent of total production of rice bran oil.

(Oils & Oilseeds Journal 34(10/11/12); 1982; 39-40)

68 Cashew exports fetch less in 1982

Exports of cashew kernels from India in 1982 totalled 31,784 tonnes valued at Rs. 150.73 crores against 29,449 tonnes valued at Rs.171.94 crores in 1981. Though the exports showed a marginal increase in quantity, this fetched only a lower earning, due to the steep fall in kernel prices in international markets. During the year, prices for whole kernels fell by about 30 per cent from their 1981 highs. Similarly, exports to USSR also declined to 18,922 tonnes this year. Against its trade plan of 20,000 tonnes in 1982, its actual purchase was very much less. The low off-take by USSR and its disinterest in making any more purchase forced the industry to dispose off the stock at lower prices in other markets.

(Hindu March 22, 1983; 13)

TRANSFER OF TECHNOLOGY AND NEW INDUSTRIES

169 Technology centre of non-aligned nations

The Prime Minister, Mrs. Indira Gandhi, told the Lok Sabha today that it had been decided to establish in India a centre for science and technology of the non-aligned and other developing countries. The heads of State and Government had welcomed the decision and requested its setting up as soon as feasible.

(Hindu March 31, 1983; 6)

FOOD REGULATION, QUALITY CONTROL AND HYGIENE

170 Prevention of Food Adulteration (1st Amendment) Rules, 1983.

G.S.R.109(E) - Whereas certain draft rules further to amend the Prevention of Food Adulteration Rules, 1955, were published as required by Sub-section (1) of section 23 of the Prevention of Food Adulteration Act, 1954 (37 of 1954), with the notification of Government of India in the Ministry of Health and Family Welfare (Department of Health) No. G.S.R. 837, dated 1st September 1981 at pages 1984-1987, in the Gazette of India, Part II, Section 3, Sub-section (i) inviting objections and suggestions from all the persons likely to be affected thereby before the expiry of 90 days from the date on which copies of the said Gazette were made available to the public.

And whereas the copies of the said Gazette were made available to the public on the 12th September, 1981;

And whereas the objections and suggestions received from the public on the said draft rules have been considered by the Central Government;

Now, therefore, in exercise of the powers conferred by sub-section (1) of section 23 of the said Act, the Central Government after consultation with Central Committee for Food Standards hereby makes the following rules, further to amend the Prevention of Food Adulteration Rules, 1955, namely:-

RULES

1. (1) These rules may be called the Prevention of Food Adulteration

(1st Amendment) Rules, 1983.

(2) They shall come into force on the date of their publication in the Official Gazette except rule 2(3) which shall come into force after six months from the date of its Publication.

2. In the Prevention of Food Adulteration Rules, 1955 (hereinafter referred to as the said rules), in rule 42.

(i) In clause (I), the words "percentage of edible common salt and" shall be omitted.

(ii) in clause (I) the following words shall be inserted at the end, namely:-

"If mixed masala is fried in Oil, it shall bear the following label:-

MIXED MASALA (FRIED)

THIS MASALA HAS BEEN

FRIED IN

(Name of the edible oil
used)

3. In appendix "B" to the said rules,

(1) (a) in items A.05.01, A.05.02, A.05.03, A.05.03.01, A.05.04, A.05.04.01, A.05.07, A.05.08, A.05.09, A.05.10, A.05.11, A.05.12, A.05.13, A.05.14, A.05.15, A.05.17, and A.05.22, after the words and figures "insect damaged matter shall not exceed 5 per cent by weight", the words "It shall be free from added colouring matter", shall be inserted.

(b) in items A.05.01.01, A.05.03.02, A.05.04.02, A.05.06.01, A.05.07.01, A.05.08.01, A.05.09.01, A.05.10.01, A.05.11.01, A.05.12.01, A.05.13.01, A.05.14.01, A.05.12.01, A.05.13.01, A.05.14.01, A.05.15.01, A.05.16, A.05.16.01, A.05.17.01, A.05.17.02, A.05.17.02, A.05.17.03, A.05.18, and A.05.23, the words "It shall be free from added colouring matter", shall be added at the end:

(2) in item A.05.21, the "whenever edible common salt is added, its percentage by weight shall be declared on the label, also" shall be omitted.

- (3) after item A.05.21, the following items shall be inserted, namely:-

"A.05.21.01 - Mixed Masala (whole) means a mixture of clean, dried and sound aromatic herbs and spices. It may also contain dried vegetables and/or fruits, oilseeds, garlic, ginger, poppy seeds and curry leaves. It shall be free from added colouring matter. It shall be free from mould growth and insect infestation. The proportion of extraneous matter shall not exceed five per cent by weight out of which the proportion of organic matter including foreign edible seeds, and inorganic matter, shall not exceed three per cent and two per cent, respectively.

The names of the spices contained in the mixture shall be indicated on the Label in descending order of composition by it".

- (4) in item A.07.03, for the words and figures "Fructose/Glucose ratio shall not be less than 0.90", the words and figures "Fructose/Glucose ratio shall not be less than 0.95, shall be substituted;

- (5) in item A.18.01, for the word "Atta" the words "Atta or resultant atta", shall be substituted.

- (6) for item A.18.07, the following item shall be substituted, namely:-

"A.18.07 - Biscuits including wafer biscuits shall be made from maidan vanaspati or refined edible oil or table butter or deshi butter or margarine or ghee or their mixture. It may contain any one or more of the following ingredients, namely:-

Edible common salt; permitted anti-oxidants; emulsifying and stabilising agents; permitted preservatives and colours; leavening agents such as baking powder; ammonium bicarbonate; ammonium carbonate; butter milk powder; cereals and their products; cheese; citric acid; cocoa; coffee extract; edible dessicated coconut; dextrose; fruits and fruit products; dry fruit and nuts; egg; edible vegetable products; amylases and other enzymes, permitted flavouring agents; flavour improvers and fixers, flour improvers; ginger; gluten; groundnut flour, milk and milk products; honey; jellyfying agents; liquid glucose; malt products; edible oilseeds; flour and meals; spices and condiments; edible starches such as potato starch and edible flour; sugar and sugar products; invert sugar; jaggery, protein concentrates and other nutrients; sodium bisulphites, sodium meta-bisulphite and other dough conditioners;

vitamins, calcium and ferrous salts; potassium iodide, malic and lactic acids; tartaric acid; vinegar and acetic acid; yeast.

Biscuits shall conform to the following standards, namely:-

- (a) Ash insoluble in dilute hydrochloric acid (on dry basis) shall not be more than 0.1 per cent.
- (b) Acidity of extracted fat (as oleic acid) shall not exceed 1.5 per cent";

(7) after item A.25.02, the following item shall be inserted, namely:-

"A.25.02.01 - Chewing gum and bubble gum shall be prepared from chewing gum base or bubble gum base, natural or synthetic, non-toxic; cane sugar and liquid glucose (corn syrup).

The following sources of gum base may be used :-

- (1) Babal, Kikar (Gum Arabic)
- (2) KHAIR
- (3) Jhingan (Jael)
- (4) Ghatti
- (5) Chiku (Sapota)
- (6) Natural rubber latex
- (7) Synthetic rubber latex
- (8) Glycerol ester of wood rosin
- (9) Glycerol ester of gum rosin
- (10) Synthetic resin
- (11) Glycerol ester of partially hydrogenated gum or wood rosin
- (12) Natural resin
- (13) Polyvinyl acetate
- (14) Agar (food grade)

It may also contain any of the following ingredients, namely:-

- (a) Glycerine;
- (b) Malt;
- (c) Milk powder;
- (d) Chocolate;
- (e) Coffee;
- (f) Gelatin, food grade;
- (g) Permitted Flavours;
- (h) Permitted Colours;
- (i) Permitted anti-oxidants;

Contd.

- (j) Permitted Preservatives;
- (k) Permitted Emulsifiers;
- (l) Sorbitol;
- (m) Lubricants, such as starch, talc, stearic acid, icing sugar, paraffin wax or liquid paraffins, food grade, or other food grade mineral oil;
- (n) Water, potable;
- (o) Acidulants, food-grade;
- (p) Nutrients like vitamins, minerals, proteins;
- (q) Titanium dioxide, food-grade (Maximum 1 per cent by weight);
- (r) Calcium carbonate;
- (s) Magnesium carbonate;
- (t) Phosphated starch;

It shall be free from dirt, filth, adulterants and harmful ingredients. It shall also conform to the following standards, namely;-

Ingredients	Chewing gum	Bubble gum
(i) Gum	Not less than 12.5 per cent by weight.	Not less than 14.0 per cent by weight.
(ii) Moisture	Not more than 3.5 per cent by weight.	Not more than 3.5 per cent by weight.
(iii) Sulphated Ash	Not more than 9.5 per cent by weight.	Not more than 11.5 per cent by weight.
(iv) Acid insoluble ash	Not more than 2.0 per cent by weight.	Not more than 3.5 per cent by weight.
(v) Reducing sugars (calculated as dextrose)	Not less than 4.5 per cent by weight.	Not less than 5.5 per cent by weight.
(vi) Sucrose	Not more than 70.0 per cent by weight.	Not more than 60.0 per cent by weight.

(Gazette of India (Extraordinary); Part II, Section 3, Subsection (i); February 26, 1983; 3-4)

171 Catechu Grading and Marking Rules, 1982

G.S.R. 80 - Whereas a draft of the Catechu Grading and Marking Rules, 1982 was published as required by section 3, of the Agricultural Produce (Grading and Marking) Act, 1937 (1 of 1937) at pages 549 to 551 of the Gazette of India, Part II, Section 3, Sub-section (i), dated the 27th

February, 1982, with the notification of the Government of India. In the Ministry of Rural Development, No. G.S.R. 205, dated the 17th February, 1982 inviting objections and suggestions from all persons likely to be affected thereby before the expiry of the period of fortyfive days from the date of publication of the said notification in the Official Gazette;

And, whereas, the copies of the said Gazette were made available to the public on the 3rd March, 1982.

And whereas no objections or suggestions have been received from the public in respect of the said draft by the Central Government;

Now, therefore, in exercise of the powers conferred by section 3 of the said Act, the Central Government hereby makes the following rules, namely:

RULES

1. Short title, application and commencement - (1) These rules may be called the Catechu Grading and Marking rules, 1982.

(2) They shall apply to Catechu produced in India.

(3) They all come into force on the date of their publication in the Official Gazette.

2. Definitions - In these rules, unless the context otherwise requires:

(1) "Agricultural Marketing Adviser" means the Agricultural Marketing Adviser to the Government of India;

(2) "Authorised Packer" means a person or a body of persons who has been granted a certificate of authorisation under rule 3 of the General Grading and Marking Rules, 1937 in relation to Catechu;

(3) "Schedule" means a Schedule appended to these rules.

3. Grade designation - The grade designations to indicate the quality of Catechu shall be as set out in column 1 of Schedule 1.

4. Definition of quality - The quality indicated by the grade designations shall be as set out, against the said designations in columns 2 to 10 of Schedule I.

5. Grade designation mark - The grade designation mark shall consist of a label supplied by the Agricultural Marketing Adviser specifying the grade designation and bearing a design consisting of an outline map of India with the word "AGMARK" and the figure of the rising sun with the words "Produce of India" and **भारतीय उत्पाद** resembling

the mark as set out in Schedule II.

6. Method of packing - (1) Only sound clean and dry container made of jute or wooden boxes or plastic bags, or tin containers or paper cartons or any other material as may be approved by the Agricultural Marketing Adviser shall be used for packing. The container shall be free from any insect infestation or fungus contaminations and also free from any undesirable smell.
- (2) The container shall be securely closed and sealed in the manner approved by the Agricultural Marketing Adviser.
- (3) Each package shall contain Catechu of the same grade designation only.
7. Method of marking - (1) The grade designation mark shall be securely affixed to every container in a manner approved by the Agricultural Marketing Adviser.
- (2) In addition to the grade designation mark, the following particulars shall be clearly marked on the label and/or container, namely:-
 - (a) Date of packing;
 - (b) Lot number;
 - (c) Name and address of Packer;
 - (d) Net weight;
 - (e) Any other particulars as may be approved by the Agricultural Marketing Adviser from time to time.
- (3) An authorised Packer may, after obtaining the prior approval of the Agricultural Marketing Adviser mark his private trade mark on a container in a manner approved by the said officer, provided the trade mark does not represent quality or grade of the Catechu different from that indicated by the grade designation mark affixed on the container in accordance with these Rules:

contd.

SCHEDULE-I

(See rules 3 and 4)

Grade designation and definition of quality of Catechu (edible) commercially known as Kattha.

General Characteristics

Definition of quality

Special characteristics

Grade designation	Catechin content per cent by weight (minimum)	Matter insoluble in rectified spirit, per cent by weight (maximum)	Solids insoluble in boiling water, percent by weight (maximum)	Total ash on dry basis per cent by weight (maximum)	Ash insoluble in dilute HCl on dry basis percent by weight (maximum)	Water insoluble residue at 37°C + 2°C per cent by weight (maximum)	Poisonous metals, ppm. (Maximum)										
							Arsenic	Lead	Copper	Zinc	Tin	9a	9b	9c	9d	9e	10
I	69.00	15.00	3.00	1.5	0.2	8.00	12.00	1	2.5	30	50	250	Catechu (edible) shall :—				
II	45.00	20.00	6.00	3.0	0.5	12.0	12.0	1	2.5	30	50	250	1. be the product obtained by crystallization of the water extractives of the heartwood of <i>Acacia catechu</i> wild				
III	30.00	25.00	8.00	4.0	0.5	16.0	12.0	1	2.5	30	50	250					

Catechu (edible) shall :—

1. be the product obtained by crystallization of the water extractives of the heart-wood of *Acacia catechu* wild fam, Leguminosae, commonly known as khair tree.
2. be comparatively free from water soluble catechutannic acid or cutch leaves, bark, cellulosic materials infestation, fungus attack, rodent contamination, sand, earth, dust or any other adulterant.
3. be astringent, slightly bitter in taste and free from unpleasant odour. When examined under microscope a freshly broken surface shall exhibit numerous shining and acicular crystals of catechin.
4. not contain any adulteration with extracts of *Arjun* bark (from *Terminalia arjuna* Bedd) gambier, cutch, filler materials such as myrobalsans, galls, china clay, chalk, starch, gum arabic, red oxide or any other foreign material.
5. have negative starch test and 5 ml of 1 per cent aqueous solution and 0.1 per cent solution of ferric ammonium sulphate shall give a dark green colour, which on the addition of sodium hydroxide solution shall change to purple.

172 Sunflower Seeds Grading and Marking Rules, 1982

Whereas a draft of the Sunflower Seeds Grading and Marking Rules, 1982 was published, as required by Section 3 of the Agricultural Produce (Grading and Marking) Act, 1937 (1 of 1937) at pages 71 to 73 of the Gazette of India, Part II, Section 3, sub-section (i), dated the 9th January, 1982, with the notification of the Government of India in the Ministry of Rural Reconstruction No.G.S.R. 33, dated the 15th December, 1981 inviting objections and suggestions from all persons likely to be affected thereby before the expiry of the period of forty-five days from the date of publication of the said notification in the Official Gazette.

And whereas the copies of the said Gazette were made available to the public on the 21st January, 1982;

And whereas objections/suggestions received from the public in respect of the said draft have been considered by the Central Government;

Now, therefore, in exercise of the powers conferred by Section 3 of the said Act, the Central Government hereby makes the following rules, namely:-

RULES

1. Short title, application and commencement: (1) These rules may be called the Sunflower Seeds Grading and Marking Rules, 1982.

(2) They shall apply to sunflower seeds produced in India.

(3) They shall come into force on the date of their publication in the Official Gazette.

2. Definitions: In these rules, unless the context otherwise requires,

(1) "Agricultural Marketing Adviser" means the Agricultural Marketing Adviser to the Government of India;

(2) "Schedule" means a Schedule appended to these rules;

(3) "Authorised packer" means a person or a body of persons who has been granted a Certificate of Authorisation by the Agricultural Marketing Adviser, for getting the commodity graded and agmarked in accordance with the grade standards and procedure prescribed under the rules;

(4) "Certificate" means Certificate of Authorisation.

3. Grade designations: The grade designation to indicate the quality of the Sunflower seeds shall be as set out in column 1 of Schedule I.

4. Definition of quality: The quality indicated by the grade designation

shall be as set out against each grade designation in columns 2 to 7 of Schedule I.

5. Grade designation mark: The grade designation mark shall consist of a label specifying the grade designation and bearing a design consisting of an outline map of India with the word "AGMARK" and figure of the rising sun with the words "Produce of India" and भारतीय उत्पाद resembling the mark as set out in Schedule II.

6. Method of marking: (1) The grade designation mark shall be securely affixed to each package in a manner approved by the Agricultural Marketing Adviser.

(2) In addition to the grade designation, the following particulars shall also be clearly marked on the label;-

(a) date of packing;

(b) lot number;

(c) net weight; and

(d) any other particulars as may be specified by the Agricultural Marketing Adviser from time to time.

(3) The authorised packer may, after obtaining the prior approval of the Agricultural Marketing Adviser, mark his private trade mark on a container in a manner approved by the said officer, provided that the private trade mark does not represent a quality or grade of Sunflower Seeds different from that indicated by the grade designation mark affixed to the container in accordance with these rules:

7. Method of packing: (1) Sunflower seeds shall be packed in new B-twill jute bags or any other type of container and in such capacity and in such manner as may be specified from time to time by the Agricultural Marketing Adviser.

(2) Packing material shall be clean and dry, free from fungus contamination and insect infestation and obnoxious smell.

(3) Each package shall contain Sunflower seeds of the same variety and of the same grade designation.

(4) Each packages shall be securely closed and sealed in the manner prescribed by the Agricultural Marketing Adviser.

SCHEDULE I

(See rule 3 and 4)

Grade designation and definition of quality of Sunflower Seeds

Grade designation	Definition of quality					General Characteristics
	Special Characteristics					
	Per cent by weight (Maximum)					
	Foreign matter	Damaged seeds	Immature, shrivelled and dead seeds	Weevilled seeds	Moisture content	
1	2	3	4	5	6	7
I	2.0	2.0	10.0	0.5	5.0	The sunflower seeds shall: (a) be obtained from the plant botanically known as <i>Helianthus annuus</i> Linn; (b) be well developed, mature, clean, dry, free from dirt, obnoxious smell, deleterious substances, insect infestation and rodent contamination except to the extent provided under special characteristics; (c) be reasonably uniform in shape, size and colour; (d) not show any visible sign of mould attack.
II	4.0	4.0	15.0	1.0	5.0	
III	6.0	6.0	25.0	1.0	5.0	

Definitions:

1. Foreign matter: shall be stones, lumps of earth, straw, chaff, stems, any other edible or non-edible seeds or any other foreign material.
2. Damaged seeds: shall be the seeds which are internally damaged or discoloured or broken, materially affecting the quality.
3. Immature shrivelled and dead seeds: shall be the seeds not properly developed and/or shrunken. Dead seeds shall be those seeds which can easily be crushed, if crushed between two fingers.

4. Weevilled seeds: shall be those seeds which are wholly or partly bored or eaten by the weevils.

SCHEDULE II
(See rule 5)
GRADE DESIGNATION MARK



(Gazette of India, Part II, Section 3, subsection (i), January 22, 1983; 229-231)

Sesame Seeds Grading and Marking Rules, 1982

Whereas a draft of the Sesame Seeds Grading and Marking Rules, 1981, was published, as required by section 3 of the Agricultural Produce (Grading and Marking) Act, 1937 (1 of 1937), at pages 2257 to 2259 of the Gazette of India, Part II, Section 3, Sub-section (i), dated the 17th October,

1981, with the notification of the Government of India in the Ministry of Rural Reconstruction, No.G.S.R. 933, dated the 25th September, 1981, inviting objections and suggestions from all persons likely to be affected thereby before the expiry of the period of forty-five days from the date of publication of the said notification in the official Gazette.

And whereas the copies of the said Gazette were made available to the public on the 2nd November, 1981.

And whereas comments/suggestions received from the public in respect of the said draft have been considered by the Central Government.

Now, therefore, in exercise of the powers conferred by section 3 of the said Act, the Central Government hereby makes the following rules, namely:-

RULES

1. Short title, application and commencement:-
 - (1) These rules may be called the Sesame Seeds Grading and Marking rules, 1982.
 - (2) They shall apply to Sesame seeds produced in India.
 - (3) They shall come into force on the date of their publication in the Official Gazette.
2. Definitions:- In these rules, unless the context otherwise requires
 - (1) "Agricultural Marketing Adviser" means the Agricultural Marketing Adviser to the Government of India;
 - (2) "Schedule", means a Schedule appended to these rules;
 - (3) "Authorised packer: means a person or a body of persons who have been granted a Certificate of Authorisation by the Agricultural Marketing Adviser for getting the commodity graded and Agmark in accordance with the grade standards and procedure prescribed under the rules;
 - (4) "Certificate" means Certificate of Authorisation.
3. Grade designations: The grade designations to indicate the quality of the Sesame seeds, shall be as set on in column 1 of Schedule I.
4. Definition of quality: The quality indicated by the grade designations shall be as set out against each grade designation in columns 2 to 4 of Schedule I.
5. Grade designation mark: The grade designation mark shall consist of a label specifying the grade designation and bearing a design consisting

of outline map of India with the word "AGMARK" and figure of the rising Sun with the words "Produce of India" and भारतीय उत्पाद resembling the mark as set out in Schedule II.

6. Method of packing: (1) Sesame seeds shall be packed in B-twill-jute gunny bags or any other type of container in such a manner as may be specified from time to time by the Agricultural Marketing Adviser.

(2) Packing material shall be clean and dry, free from fungus and insect attack and obnoxious smell.

(3) Each package shall contain the Sesame seeds of the same variety and of same grade designation.

(4) Each package shall be securely closed and sealed in the manner prescribed by the Agricultural Marketing Adviser.

7. Method of marking: (1) The grade designation mark shall be securely affixed to each package in a manner approved by the Agricultural Marketing Adviser;

(2) In addition to the grade designation, the following particulars shall also be clearly marked on the label or container or both on label and container;

(a) Date of packing;

(b) Name and address of packer;

(c) Net weight and

(d) Any other particulars, as may be specified by the Agricultural Marketing Adviser from time to time.

(3) The authorised packer may, after obtaining the prior approval of the Agricultural Marketing Adviser, mark his private trade mark on a container in a manner approved by the said officer, provided that the private trade mark does not represent a quality or grade of Sesame seeds different from that indicated by the grade designations mark affixed to the container in accordance with these rules.

SCHEDULE I

(See rule 2 and 4)

Grade designation and definition of quality of
Sesame seeds

Grade designation	Definition of quality						General characteristics
	Special characteristics						
	Foreign matter, percent by weight maximum	Immature, shelled and dead seeds, percent by weight (Maximum)	Damaged & Discoloured seeds, percent by weight (maximum)	Total impurities (Total of col. 2 to 4 percent by weight (maximum))	Admixture of other varieties/ types, percent by weight (maximum)	Moisture content, percent by weight (maximum)	
1	2	3	4	5	6	7	8
Special	0.5	1.0	Nil	1.5	5.0	5.0	The sesame seeds shall be (a) the seeds obtained from the plant <i>Sesamum indicum</i> Linn Syn. <i>Sesamum Orientale</i> Linn: family- Pedaliaceae. (b) free from fungus and insect attack, live insects, obnoxious smell, rodent contamination excreta, non-edible oil seeds, artificial colouration and all other impurities except to the extent specified.
Good	1.0	2.0	1.0	3.0	10.0	6.0	
General	2.0	3.0	2.0	5.0	15.0	7.0	

Definitions:

- (1) Foreign matter; means dust, lumps of earch, dirt, stones, stem-straw or any other impurity and/or any other edible/non-edible seeds.
- (2) Damaged and discoloured seeds: are the seeds that are materially or internally damaged or discoloured materially affecting the quality.

(3) Immature shrivelled & dead seeds: are the seeds which are imperfectly developed and or shrunken. Dead seeds are those seeds which are duds and can be easily crushed by finger.

Admixture of other types/varieties: Means admixture of brown/black and other coloured sesame seeds in white and vice versa.

(Gazette of India, Part II, Section 3, subsection (i), January 22, 1983; 224-226)

4 Dimerized vegetable oil, tall oil use approved

The Food and Drug Administration issued a rule on May 25 permitting use of dimerized vegetable oil or tall oil or tall oil acids, azelaic acid, ethylenediamine and piperazine as the basic resin in coatings for polypropylene film in contact with food.

(*Journal of the American Oil Chemists Society*, 59(8); 1982; 617A)

5 BHA use curtailed by Japan processors

Japanese food producers reportedly dropped use of BHA earlier this year after scientists at the Nagoya City University Medical School said studies showed BHA was carcinogenic in F344 laboratory rats, according to the *Japanese Journal of Cancer Research*.

(*Journal of the American Oil Chemists Society*, 59(8); 1982; 617A)

6 Ethyltoluene, formamide recommended for testing

The tenth report of the Interagency Testing Committee to the federal Environmental Protection Agency recommended adding ethyltoluene and formamide to the list of substances recommended for testing under the Toxic Substances Control Act. Ethyltoluene is used widely in gasoline and also in commercial solvents used in paint and printing inks. Formamide, the report said, is used as a chemical intermediate in various processes including the purification of fats and oils. The committee recommended formamide be tested for genotoxic effects, carcinogenicity and other chronic effects.

(*Journal of the American Oil Chemists Society* 59(8); 1982; 617A)

7 Lead report brings new alarm over petrol

The government's case for retaining lead in petrol has been based heavily on the 1981 Lawther report. Lawther concluded that inhalation was the only

significant source of human exposure to lead from vehicles. It contributed no more than 20 per cent of the lead in the blood of adults and 10 per cent in children.

Now, however, a working party on heavy metals in food has concluded that 16 per cent of lead intake in the average diet comes from the contamination of food crops by lead - almost all of which comes from petrol fumes. That brings the officially acknowledged contribution of petrol-lead to blood-lead up to 30 per cent in adults and nearly 25 per cent in children and boosts the case against lead in petrol.

(*New Scientist* 97(1343); 1983; 291)

178 Food grade nickel

This may be labeled "generally recognized as safe" (GRAS) as a catalyst in manufacturing hydrogenated fats and oils. An FDA proposal would affirm the substance used at a level not to exceed current good manufacturing practices, including the removal of the nickel from fats and oils following hydrogenation. The Select Committee on GRAS Substances noted that it was not able to find evidence that nickel, in forms presently used, is carcinogenic when taken orally.

(*Cereal Foods World* 28(1); 1983; 57)

179 Deletes microbial specs for fish protein isolate

FDA is deleting the microbiological specifications from the regulation covering use of fish protein isolate as a food supplement, until it has had an opportunity to review the results of a study being conducted by the National Academy of Sciences on microbiological criteria for foods.

(*Food Technology* 37(2); 1982; 32)

180 Cleaning water with horseradish

Horseradish is the star ingredient in a new enzymatic system for treating industrial wastewaters. Research in M.I.T.'s Department of Nutrition and Food Science, shows that peroxidase - an enzyme found in horseradish - causes hydrogen peroxide to oxidize and therefore neutralize industrial pollutants.

In the presence of peroxidase and hydrogen peroxide, phenols and aromatic amines are thus turned into unstable molecular fragments - called free

radicals. These in turn react with other molecules to produce even larger free radicals. Eventually these molecules - polymers - are stabilized and precipitate out of solution. Because they are nearly insoluble, unlike the initial chemicals, the polymers can easily be removed and separated by simple filtration or sedimentation.

The three other advantages of the horseradish enzyme are:

The final precipitate has significant value as fertilizer. (In processes such as bacterial degradation, the bacteria use the phenols for their own metabolism and produce only carbon dioxide.)

Unlike bacterial degradation, which is biological and sensitive to cold temperatures, the horseradish reaction is chemical and can be used year-round.

The cost compares favourably with that of other methods - depending on the price for horseradish, of course.

If the process is successfully transferred from laboratory to industry, the supply of horseradish - a seasonal product - may not be adequate. But it was also found that a bacterium naturally produces a peroxidase equally as effective as the horseradish enzyme. Grown in laboratories, the bacteria would offer an ample supply of peroxidase.

(Technology Review 85(5); 1982; 86-87)

PERSONALIA

Nil

RAW MATERIALS

Nil

STORAGE AND INFESTATION CONTROL

181 Prolonging shelf life of sugar apples

Sugar apple (*Annona squamosa* Linn.) with white flesh and multiple brown seeds, is one of the fruits exported from Thailand to Asia, Europe and the Middle East. A major obstacle to increasing the export is its short shelf life of 2-4 days, which means the fruit invariably arrives at the market in an over-ripe condition. The Thailand Institute of Scientific and Technological Research (TISTR) recently conducted an investigation to ascertain methods of lengthening the shelf life of sugar apples at ambient temperatures of 30-32 C. The methods evaluated included a potassium permanganate impregnated ethylene absorbent and a food grade surface coating. Results showed that 90% of the control fruit and the fruit with ethylene absorbent became either ripe for eating or over-ripe within 4 days. On the other hand, 75-85% of the fruit treated with the surface coating remained hard on the fourth day.

(*Asean Food Handling Newsletter* No.8; 1983; 4)

182 A novel idea in insulated fish-box design

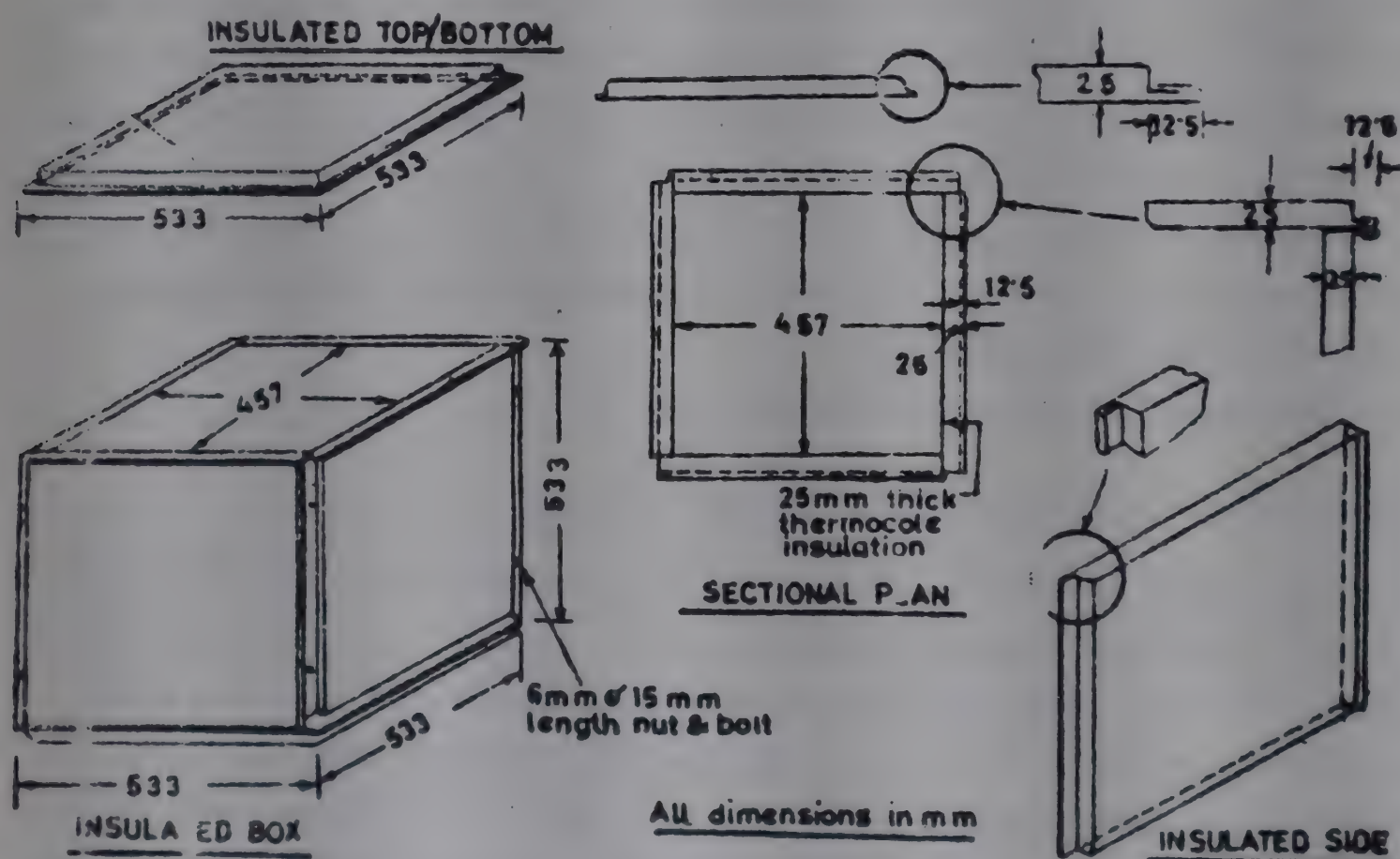
An estimated two-thirds of India's fish landings of 2.4 million tonnes per annum are consumed as fresh fish - that is, without being subjected to any long term preservation treatment other than chilling with crushed ice. At least one-half of this amount of fresh fish has to be transported over varying distances of less than 100 km to over 1000 km before it is delivered to the actual consumer. Various modes of transport - bicycles, road trucks, carrier launches, rail wagons, etc. - are employed for this purpose, depending on the distances involved.

Containers most widely employed for transporting fish are split bamboo baskets in the south and reed or *harhar* baskets and dealwood/plywood boxes in the north. Both these types leave much to be desired from the points of view of hygiene, safety and efficiency. A scientific and hygienic container that can be suggested for this purpose is an insulated metallic box, which lends itself to cleaning and disinfection while providing good

thermal efficiency.

Conventional insulated boxes are two-piece ones - that is, the main body comprising the four sides and bottom to which a lid is hinged. These boxes being costly have to be returned to the despatching centres for re-use. The most serious bottleneck in the wider application of this type of container is that, once distorted due to rough handling, the whole box has to be discarded. To obviate this problem, a novel idea was thought of and an insulated box comprising six pieces bolted together to form the fish container was designed and fabricated.

The insulated fish box of new design is made of 22-gauge GI sheet using 25 mm thick expanded polystyrene slabs as insulating material. The top and bottom pieces are identical, 50.8 cm square with 1.25 cm wide flaps on all the four sides projecting outward.



Similarly, all the four sides are identical, measuring 48.3 cm x 45.7 cm with similar flaps at all the edges bent in appropriate directions. The insulant is sandwiched between the double layer of the metal sheet. The folded ends of the metal sheet are properly soldered to render them water-tight. Bolting is done through holes drilled on the flaps using GI bolts of 6 mm diameter and 15 mm length.

The new box has internal and external dimensions of 45.7 cm³, and

and 50.8 cm³, respectively. Tare weight is 19 kg and capacity 70 kg (ice and fish together). The box can be dismantled for cleaning and returning to the despatching centres for re-use.

(See also Item 224 in *Food Digest* 4(3); 1981; 112)

(*Invention Intelligence* 18(1-2); 1983; 39)

FOOD ADDITIVES

183 Liquid peanut butter

This may be "rippled" into vanilla or chocolate ice cream or may be used to flavour ice cream or ice milk. When refrigerated, the liquid peanut butter remains in solution and does not separate. If the product is stored at room temperature and separates, it can easily be mixed back into solution. The liquid peanut butter reportedly has excellent flavour release.

(*Food Technology* 37(5); 1983; 206)

184 Imitation chocolate flavours

Imitation chocolate flavours may be used to fortify or replace cocoa in cakes, cookies, confections, desserts, and other bakery foods. Chocolate paste, imitation # 2347 is a fat miscible flavour which may be used as a partial replacement for cocoa. One pound of # 2347 equals the flavour in 25 lb of cocoa. Chocolate flavour, imitation # 1322 may also be used as a partial replacement for cocoa. One to 2 oz of # 1322 is equal in strength to 7 lb of cocoa. Chocolate imitation, Acme # 1788 may be used as a complete replacement for cocoa when used at a rate of 2% of the total weight of the end product.

((*PFNDAI Newsletter* No.16; 1983; 2)

185 Maleic anhydride

Adarsh Chemicals and Fertilizers manufacture maleic anhydride (MAN) for application in industrial chemistry. The major end-use of maleic anhydride is in polyester resin because of its ability to combine both condensation and addition type of polymerisation. Addition of about 2% maleic anhydride reportedly improves the colour and accelerates the reaction and processing time of resin. The resin thus prepared has higher hardness and higher tensile strength. Other applications are in: agricultural

chemicals for manufacturing malathion insecticide and maleic hydrazide (plant growth regulator); food additives; pharmaceuticals; wetting agent; lubricant additives; alkyd resins; polyurethane; PVC bonding; and drying oils.

(*Industrial Products Finder* 11(7); 1983; 174)

PROCESSES

186 Processing of fruits at farm level in Punjab

An attempt was made to produce fruit (mango and citrus) beverages at the farm level. In the case of citrus fruits, the cost of one bottle of squash can to Rs. 5.20-5.46, that of a bottle (200 ml) of ready-to-serve drink was Rs. 0.42-0.47. The cost of mango pulp can to Rs. 5.02 per kg of mango squash to Rs. 6.01 per bottle, of ready-to-serve drink Rs. 0.57 per 200 ml and of nectar to Rs. 1.04 per 200 ml. These products appeared to have a good marketing potential in and around Ludhiana. A scheme involving an investment of Rs. 270,000/- has been prepared for processing $\frac{1}{2}$ tonne of pulp or juice per day over a 100-day period (20 days for mango, 40 for tomato, and 40 for citrus).

(*Punjab Horticultural Journal* 22(3/4); 1982; 209-213)

187 Production of sugar syrup from Mahua (*Madhuca latifolia*)

The process for production of syrup from Mahua (*Madhuca latifolia*) flowers involves extraction with water, clarification, decolourisation and concentration of sugar syrups. From one tonne of mahua flowers, 550 kg of sugar syrup was obtained. This light coloured syrup with characteristic mahua flower smell has a sugar content of 75-78% and a density of 1.39/ml. As a sweetening agent, it may be used for food products and in confectionery industry.

(*Research and Industry* 28(1); 1983; 29-31)

188 Oil from palm date seeds.

The Oil Technological Research Institute (OTRI) at Anantpur (Andhra Pradesh) has achieved a break-through in processing and extracting oil from palm date seed which are now thrown away after the fleshy part is eaten. The seeds, in the process evolved by the institute are powdered mechanically and the powder is moistened by 12 per cent and the content is cooked in a steam kettle.

The work carried out by OTRI in collaboration with the Karnataka University, Dharwar, has disclosed that the extracted oil is of saturated type. (Iodine value 50) and is yellow in colour. It could be refined and bleached to very light colour and the refined oil is of edible variety.
(*Oils & Oilseeds J.* 35(1/2/3); 1982; 56)

189 Oil from chilli seeds

Studies carried out at the Oil Technological Research Institute, Anantapur show the chilli seed contains 26% oil. The oil obtained from whole seed is dark in colour. By dehulling the seed and pressing the kernel, an orange coloured oil is obtained. Chilli-seed oil is rich in linoleic acid (over 70%) and has resemblance to safflower and soyabean oils. The oil can be easily refined and bleached and the pungent principle present in raw oil removed. Snacks prepared by deep fat frying in refined chilli seed oil are acceptable. The oil can also be used in paints and soaps manufacture.
(*Spices Newsletter* 17(7); 1983; 10)

190 Essential oil process improved

Schmid Hydrodiffusion SA of Switzerland have developed a process for the production of essential oils, leading to savings in time, steam and cooling water. In the Schmid hydrodiffuser, the steam is injected downward, in the logical sense of law of gravity. After its osmotic action on the vegetal cells, the steam immediately enters the cooling zone where condensation takes place. Therefore, the still-head and the goose-neck are eliminated. The hydrodiffuser forsakes the cylindrical shape in favour of a parallelepiped which reportedly allows for improved distribution of the loaded vegetal. The system works with steam at low pressure (e.g. 0, 100 bar at the steam inlet), which then spreads uniformly throughout the load, without causing condensation or excessive packing-down of the vegetal. The cooling is assured by a powerful element integrated under the

vegetable load. The condensate flows freely towards a large collector where total equilibrium with the atmospheric pressure is established, it is said. To discharge the exhausted vegetal from the Schmid hydrodiffuser it is sufficient to slide the basket draw along its rails and open the bottom grill. The load falls into a portable carrier for removal.

(Industrial Products Finder 11(7); 1983; 81)

191 Improving the processing and handling of sardines

It is estimated that only 25% of the catch arrives at the shore in a condition which meets the standards required by canneries.

Experiments have investigated the use of a solution of salt plus potassium sorbate (with acetic acid to control acidity) as a preservative/antioxidant to be added to the fish while still on board, and have measured its effect on the shelf life of the final product.

The suitability of sea water as the basis for the potassium sorbate solution for use by fishermen in postharvest treatment of the fish is also being investigated.

(Asean Food Handling Newsletter No.8; 1983; 4)

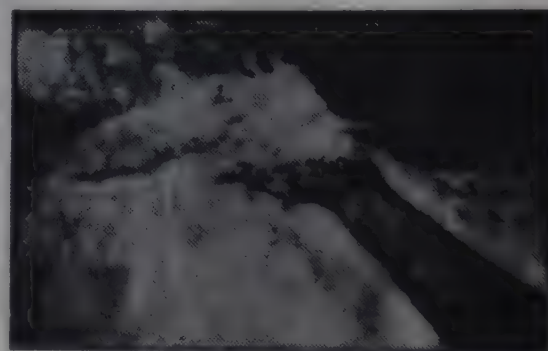
192 Meat/fish processing cell

Thirole have developed a processing cell that enables meat and fish to be processed at low temperature while giving ideal drying, steaming and smoking characteristics irrespective of climatic and seasonal changes. The modular stainless steel cells are fitted with separate ventilation for each module, which means that processing may be adapted to production and may range from 200 kg/day to several tonnes/day. The microprocessor provides 9 working cycles each made up of 12 programmes, thus offering considerable accuracy for hygrometry temperature regulations.

(Industrial Products Finder 11(6); 1983; 119)

193 Silicon-based antifoam emulsion FG-10

manufacturers to recover starch from the water that transports and washes raw potatoes. (Photo shows recovered starch). The defoamer improves plant cleanliness and also reduces the load on wastewater treat-



ment systems. One quart of the defoamer is required for every 110 gal of water.

(*Food Technology* 37(3); 1983; 112)

BYPRODUCTS AND WASTE UTILIZATION

194 Ethanol from whey waste

A project to produce ethanol from whey waste of dairies is coming up in California. The plant is being built at Manteca at a cost of over \$ 2 million. It will have the capacity to process nearly 5 lakh lb of whey/day. The yearly production is estimated around 4 lakh gals of anhydrous ethanol.

In the process, the whey will be first concentrated by reverse osmosis and the whey proteins recovered by a proprietary precipitation process. The concentrated deproteinised whey will then be fermented in a continuous fermentation system, specially designed for the process. After fermentation, anhydrous ethanol will be recovered by an energy efficient distillation system. The 'bottoms' will be further concentrated by evaporation. In addition to ethanol, the plant will produce whey protein animal feed in wet case form and a high-protein liquid feed supplement for cattle, hogs and poultry.

(*Chemical Weekly* 28(21); 1983; 100)

195 Profitable use of prawn shell waste

At the Cotton Technological Research Laboratory (CTRL), Bombay, it has been found that prawn shells, hitherto considered a waste, could possibly be used to biological control two important soil-borne fungal pathogens (*Verticillium dahliae* and *Fusarium oxysporum* f. *vasinectum*) which attack the cotton crop and also to supply of additional nutrients to the cotton plants. Thus providing an avenue for fruitfully utilizing this industrial waste.

It has been estimated that the sea-food canning industries in India generate about 40,000 tonnes of prawn shell waste annually. If this waste is not disposed of without time lag, it might lead to serious environmental pollution and health hazards.

This industrial waste is also a rich source of chitin, nitrogen and some minerals, which can be successfully used to amend the soil to the

benefit of cotton growers.

The experiments revealed that the plants, which were raised in soil to which prawn shell waste was applied, grew much healthier and taller, as compared to the stunted and wilted plants of control plants.

(*The Hindu* August 24, 1983; 20)

PROCESSED PRODUCTS

196 Modified tapioca starches

Modified tapioca starches exhibit smooth texture and bland taste. Type I modified tapioca starch, featuring a tender gel-set upon cooling, may be used in fruit pies, cream pies, dry mixes, cream fillings, gravies, sauces, and spreads. Type II, which is especially suited to produce a smooth texture, may be used for canned and bottled foods requiring thickening with no off flavour. Type III is a freeze-thaw stable starch exhibiting a smooth texture with high viscosity and no gel set. It may be used for bakers' jellies, frozen entrees, and frozen and canned pudding. Type IV is also a freeze-thaw stable modified tapioca starch. It is stable under extreme heat and low pH conditions, and it produces a smooth texture with a medium viscosity with no gel when cooled.

(*Food Technology* 37(1); 1983; 100)

197 Fatty oil from citrus pips

The Oil Technological Research Institute at Anantapur has successfully completed its research work in extracting valuable fatty oil from the pips of citrus fruits. About half a million tonnes of different varieties of citrus fruits are produced annually in India. On an average about 15,000 tonnes of pips are wasted. Research was done both on pips from sweet oranges (Mandarin) and sour lime.

The pips were mechanically cleaned, dehulled, cooked and crushed in an expeller. The oil yields varied from 21 to 29 per cent depending upon the mode of processing and parameters maintained. Lime pipe gave higher oil yields of 27 to 29 per cent as against the 21 to 24 per cent from the seeds of sweet orange. The oil which is greenish brown in colour with a bitter taste and pleasant odour, becomes bland and light yellow in colour after refining and bleaching. The pip oil, is of non-drying type. The

typical fatty acid composition of citrus pip oils is saturated 36 per cent (mainly palmitic and stearic) and unsaturated 64 per cent (mainly oleic, linoleic and linolenic). It is most suitable for soaps, fatty acids and alkyd resins. The cake is moderately rich in nitrogen content and can be used as a plant nutrient.

(*The Hindu* May 25, 1983; 17)

198 Fish protein

The new product, called *Marinbeef*, is a low-cost extender for minced-meat products that rehydrates to five times the weight of the dry powder. Moreover, *Marinbeef* also may be used alone in many products as a meat substitute.

The *Marinbeef* process involves the use of both low-fat and fatty fish of any species. The low-fat fish are deboned, blanched and partially dried in the first step of the process. In a parallel process stream, the fatty fish are chopped and washed, deboned, blanched, dried, blanched again in an alkaline solution, and dealkalinized.

In the second step of the process, fish in parallel streams are combined with other ingredients, the pH is adjusted, and the fish are then ground into a viscous paste.

In the third step of the process, this kneaded fish meat is extruded and solvent-extracted twice (the fatty fish-meat paste gets a third extraction). In this stage of the process, ethanol is used to denature and coagulate the protein, causing it to adhere tightly to the fish muscle protein. At the same time, there is a certain amount of dehydration and defattening.

The parallel process streams are passed through another extraction step, desolventized and dried. The separate powders are then weighed and combined for packaging.

(*Food Engineering International* 8(4); 1983; 25)

EQUIPMENT AND MACHINERY

199 Agro-equipments

A cashew shelling machine has been developed by the MERADO Centre of CSIR in Cochin. The capacity is 10-12 kg of kernel per worker in an eight hour shift.

The coconut drier developed by MERADO centre in Madras and Cochin has a capacity of 500 kg dry copra/hour. It is being heated electrically.

A range of tea processing equipments has been developed by Tocklai Experiment Station, Jorhat, which is suitable for continuous operation.

The CMERI, Durgapur, has developed a rice polishing machine of capacity 200-300 kg/hr. The prototype is under test.

(*Polytechnology* No. 18; 1983; 8)

200 Vegetable harvester

Budzyn-Seynes have developed a harvester that can be used for harvesting tomatoes for tinning, onions and potatoes. A compacted towed machine, the harvester is equipped with a sorting table, enabling the harvested product to be delivered directly to the tinning plant.

(*Industrial Products Finder* 11(8); 1983; 83)

201 Centrifuge/chemical equipment

DPEW manufacture a range of centrifuges, chemical plants, and textile machinery and parts. Their centrifuge/hydro extractor comes in different types; high speed centrifuges for removing coolant and de-oiling scrap; and hydro extractors for dyeing plant, slaughter houses, etc. The centrifuge, which features a fully-opening lid, comes in 2 models - HEL-36 (ii) and HEL-48 (iv). The former's basket diameter is 914 mm and speed 1,000 RPM, while those of the latter are 1,219 mm and 800 RPM, respectively. Their maximum loading capacities are 250 and 370 kg. They work on 7.5 and 15 HP motors. The company's other products are: pressure vessels, heat exchangers, reactors, tanks, etc.

(*Industrial Products Finder* 11(4); 1983; 203)

202 Filling machine

NBI offer an automatic filling machine, on actual weight or volume basis, for liquid and powder. The unit is based on indexing table type design. Empty containers are loaded manually at one station and are filled at the opposite station automatically to the exact weight or volume. Sealing operation also can be done automatically by providing in between stations. A total automatic system can be provided to lift the containers for weighing between 5 and 50 kg and transfer the same to conveyors or trolleys. There will be no liquid/powder filling if there is no container at the filling station. Different models are available for miniature filling, heavy

filling up to 50 kg. and medium filling up to 5 kg. Electronically controlled filling machines can be supplied to suit requirements.

(*Industrial Products Finder* 11(4); 1983; 98)

203 Bin activator

Utkarsha Engineers have developed a bin activator for handling fertilisers, chemicals, food products, talcum powders, etc. The bin activator handles the material on first-in first-out basis without segregation, de-aeration and conditioning to uniform bulk density to facilitate bagging/filling operations. The device is ruggedly built to stand taxing, continuous working without any attention. The activator can be supplied in various sizes and a variety of materials of construction and surface treatments.

(*Industrial Products Finder* 11(7); 1983; 129)

204 Gravity separator

Mariella Engineers of Bombay have developed a separator that works on the specific gravity principle for any dry separation. Products float on an air bed and are classified by weight difference. The unit separates cereals, legumes and other seeds as well as germs from grits in corn mills, etc. It is also useful in oilseed processing for separating good seeds prior to crushing: cork processing for separating good cork from impure bark; and rubber regenerating for separating tramp iron and other impurities from shredded, used rubber. The machine comes in capacities up to 1.5 TPH, while units up to 4 TPH can be made to suit requirements. Also available are stoners for separating stones from wheat, soyabean, groundnut or any other grain. Capacities up to 12 TPH can also be offered.

(*Industrial Products Finder* 11(6); 1983; 67)

205 Permanent magnetic drum separator

Indu Magnetics offer a permanent magnetic drum separator for continuous removal and discharge of ferrous from the material under process in chemical and food processing industries. It has high energy magnetic elements to develop strong magnetic field over the outer surface of

rotating drum. The stationary magnetic assembly is half-a-circle and can be adjusted and locked at any angle as the application demands. The shaft



is of EN-8 steel, flanges are of aluminium alloy LM-6/304 or 316 stainless steel, and drum is of 304/316 stainless steel. The minimum size available is 300 mm ϕ x 300 mm length. Other sizes can be supplied to suit requirements.

(*Industrial Products Finder* 11(7); 1983; 191)

206 Food processing machine

Techno-Equipments manufacture a range of food processing machines and equipment, particularly suitable for the canning process. The range includes SS jacketed kettles, fruit pulpers, juice extractors, sterilisers, exhaust boxes, canning retorts, bottle filling and washing machines, papaya cubing machines, etc.

(*Industrial Products Finder* 11(4); 1983; 219)

207 Shrimp processing machinery

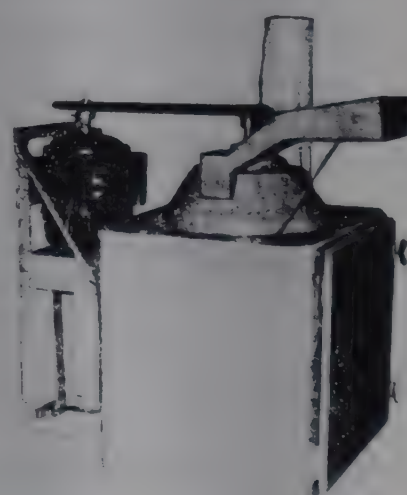
M/s. Laitram Machinery Inc. U.S.A., are manufacturing high capacity shrimp peeler, cleaning, waste separating, deveining and grading machines etc. M/s. Supreme Corporation, 10 Rita Villa, J.B. Nagar, Andheri, Bombay 400 059 are the Company's representative in India.

(*Seafood Newsletter* 60(3); 1983; 10)

208 Pulveriser

Unique Enterprises have developed a pulveriser in which pulverisation takes place in open space, under forces of impact with chamber wall and mutual collision of particles, resulting in considerable power saving. Pulverisation of spices can also be done in this machine. With top suction it is possible to have fine grinding up to 300 mesh.

(*Industrial Products Finder* 11(4); 1983; 114)



209 Bottle washer

Hilden automatic bottle washer comes in two types - with soak compartment primarily used when bottles are recycled and without soak compartment recommended when new bottles are used - and capacities up to 400 bottles/minute. The washing cycle in all washers consist of internal and external high pressure jets of warm recycled water, hot caustic solution, hot water

and final rinse with clean water (usually demineralised water). When recycled bottles are used the washer can be provided with a label flusher to remove old labels.

(*Industrial Products Finder* 11(4); 1983; 187)

210 Universal can stripper

This simplifies the teardown of can seams for determining tightness and wrinkle rating. The universal can stripper cuts the cover hook and separates it from the body hook without distortion. The entire stripping operation is done in one step and takes less than 5 sec. The stripper may be used on steel or aluminium cans with cover diameters from 202 to 211. The stripper reportedly is faster and simpler to use than conventional teardown equipment such as hand tools or seam lathes. Distortion of the seam is eliminated with the stripper because of the design of its roller cutters. Units are available with a double-bladed seam saw for cutting seam cross sections and with either one or two roller cutters.

(*Food Technology* 37(5); 1983; 212)



211 Enzyme cleaners

A cocotail of selected microbial cultures, enzymes and other ingredients has been introduced to the UK by Savilles Brentchem as an alternative to regular maintenance cleaning of fat traps and gulleys.

The formulation of microorganisms in Bio-Det is reckoned by the firm to set up an 'enzyme factory' which biologically digests and liquifies grease, fat, food scraps and other organic waste before they accumulate and solidify.

It is said to be non-toxic, non-acidic, non-caustic, non-flammable and fume free. For full benefit of the treatment, the product needs an uninterrupted period to act of at least two hours.

(*Baking Today* 3(4); 1982; 52)

212 Bactericidal hydroclean finds many applications

Bactericidal Hydroclean quickly cleans dirt from metals, plastics, glass and ceramics and has many applications within manufacturing, distributive and service industries including agriculture, food, catering,

transport and mining. It is also ideal for institutional use. Bactericidal Hydroclean is especially effective for removing food fats, blood, protein, moulds and fungi, smoke and nicotine stains, traffic, film, oils and grime, oily asphalt and rubber marks. It strips acrylic polish, can be used on floors, walls and ceilings and is particularly useful for cleaning engines and plant.

Versatile and economical in use, Bactericidal Hydroclean is odourless and will not taint food or food preparation surfaces. It is Glycol Ether free, non-caustic and fully biodegradable. Safe on all hard surfaces, it is not affected by water.

(Food Flavourings, Ingredients Processing and Packaging 4(7); 1982; 61)

213 Groundnut decorticator

Dandekar Brothers manufacture the Baby Style groundnut decortivating machine for shelling out groundnut seeds or kernels by hand or 1 HP electric motor operation. Seeds are separated and husk is blown out simultaneously with little effort. The unit can decorticate 50 kg/hr and is suitable for small farmers and traders. Also available are agricultural implements, power decorticators, plano-knife grinders and milling machines.

(Industrial Products Finder 11(4); 1983; 161)

214 Cashewnut sheller

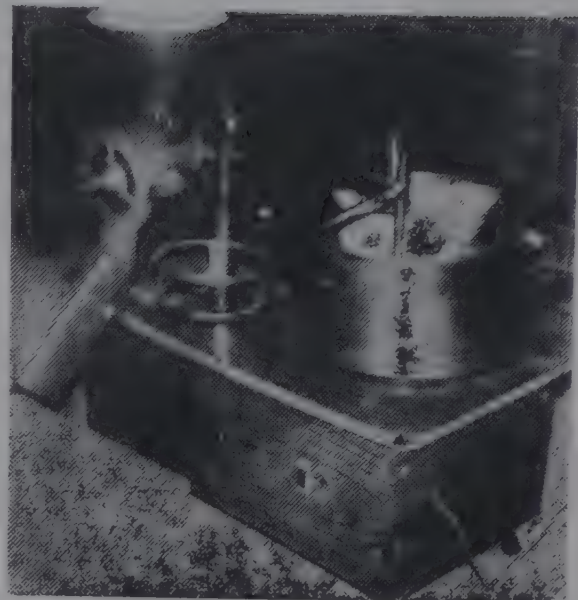
The processing of cashew is normally done through a series of steps like driving, roasting, shelling, pulling, and packaging. While the other steps have been modernized to some extent, the shelling operation is still carried out manually. To reduce the human drudgery involved in the prevailing manual operation Mechanical Engineering Research and Development Organisation, Cochin, has designed a simple and inexpensive sheller. This also eliminates the health hazards caused by contact with the corrosive shell liquid. It is a semi-automatic device with shaped cutters to be manipulated by hand and foot.

(CSIR News 33(12); 1983; 90)

215 Three in one mill

A mini mill suitable to village scale operation has been developed for splitting grain legumes. It is now found that by easy replacement of an abrasion disc the same mill can be converted to a dry grinding unit for

all types of cereal grains. This 2 in one is coupled with the commercially available wet grinder. This unit consists of one dhal mill cum dry grinding unit and the wet grinding unit. Both the components are mounted over a wooden box with laminated finishing and driven by a 0.25 HP electric motor. A dog clutch arrangement is provided so that any one of the equipments can be operated at a time by eliminating the idle running of the other. This 3 in 1 unit is capable of splitting 30 kg of legumes and grinding 30 kg of cereal grains per hour. The dhal recovery is around 80 per cent in the case of redgram. The wet grinder's capacity is 2 litre of soaked rice per batch. This three in one mill unit costs Rs. 2,900/-.



(Tamil Nadu Agricultural University Newsletter 12(11); 1983; 3)

216 Sigma mixer

The GR heavy sigma mixer finds applications in process industries - chemical, pharmaceutical, foodstuff, nuclear and explosive. The mixer is used for mixing viscous compounds and masses such as fibreglass dough moulding compound, rubber compound, resin, etc. It is offered with jackets for heating/cooling or vacuum arrangements with capacity ranging from 5 to 5000 litres.

(Industrial Products Finder 11(6); 1983; 131)

217 Planetary mixer

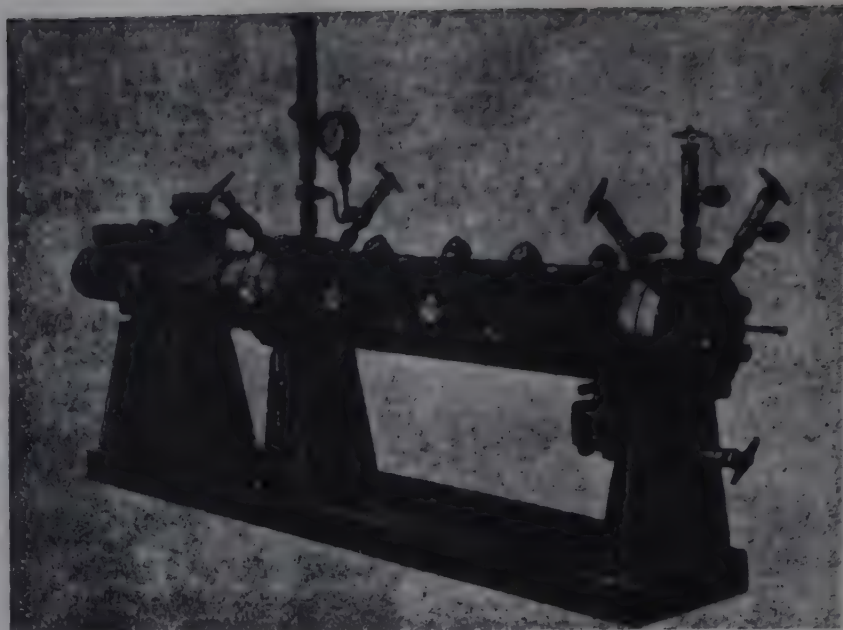
Flora Engineering Corporation manufacture a planetary mixer in sizes ranging from 50 to 500 kg. All contact parts are made of stainless steel. The mixer is provided with a mechanism for raising and lowering the mixing pan, and has a heavy-duty four-speed gearbox.

(Industrial Products Finder 11(8); 1983; 31)

218 Autoclaves and stirrers

Uhde GmbH (Fed. Republic of Germany) manufacture standard autoclaves with pressure ratings of 325 and 700 bar for operating temperatures of about 350 C. Capacities range from 0.5 to 25 litres. Autoclaves of more

than 50 litres capacity are constructed depending on pressure, temperature, stirrer type and material. A suitable stirrer can be provided for every autoclave. The available stirrer drives are: mechanically coupled type with stuffing box, and permanent-magnet-coupled rotary unit without stuffing box.



(*Industrial Products Finder* 11(8); 1983; 119)

219 Multi-purpose fryer

A new multi-purpose fryer (patents pending) available from Bennett Swiftline incorporates a cross-flow flue gas heating system using gas or light oil combined with a practical insulation system. According to the manufacturers utilisation of fuel is maximised, and heat loss during operation is kept to a minimum. Electrically heated models will also be available.

Bennett Swiftline conveyors are available to satisfy various product requirements. Continuous wiping of the pan is achieved during operation and there are variable conveyor speed and cooking oil temperature controls. Fines are carried to the pan sump and are removed automatically by the integral fines removal conveyor.

(*Food Flavourings, Ingredients, Processing and Packaging* 4(7); 1982; 41)

220 Integral solar collector-cum-dryer

Jyoti Ltd., Baroda, has developed an integral solar collector-cum-dryer for hot air drying applications. In this dryer, the drying chamber roof and front are converted into solar collectors. The air heated through this integral collector is drawn into the chamber using exhaust fans (or suction fans)

depending on the size of the chamber; with the use of integral collectors, the temperatures inside the chamber are maintained at 10 C to 15 C above the ambient temperatures. This, along with the forced flow through the product being dried, results in acceleration factors of 2 to 3.

(Documentation Bulletin No. 51; 1983; 16)

221 A portable solar cooking unit

The CMERI cooker consists of a collapsible, curved reflector (of about a meter diameter) mounted on a tripod light-weight stand. The reflector concentrates sun rays for cooking in a specially designed two-chamber pot. The stand can be manoeuvred to track the sun. The total height of the unit is about 1.5 m. The components of the unit are detachable and can be kept in a small kit. Hence the portability of the unit.

The cooker is suitable for small families for regular use as well as for occasional use as in camping. The gadget takes less than two hours for cooking in winter, and much less in summer. The cost including those of the cooking pot and the carrying case is about Rs. 400/-.

(Documentation Bulletin No. 51; 1983; 15)

222 Solar basket

The International Crops Research Institute for Semi-arid Tropics (ICRISAT) has developed an inexpensive solar basket which is capable of cooking meals that require wet cooking, steaming, baking, roasting but not frying. The model consists of a metal frame for holding and adjusting the sun basket according to seasonal and daily changes of the sun's position. Sunlight is collected by a reflecting mirror. 1.2 metre, which is glued into a parabolic shell made of fibreglass. A water pipe that serves as a timing device for automatic adjustment of the position of the mirror during the day is integrated into the stand.

(Documentation Bulletin No. 51; 1983; 16)

223 Solar dryer

The National Institute of Oceanography, Dona Patila, Goa, has designed a cabinet type solar dryer-cum-cooker, which has an efficiency of 50 per cent. The gadget can dry coconuts, chillies and grapes in one-fourth of the time otherwise required for sun-drying. Its unique feature is the

metallic hanger that further increases the temperature of the air inside by 10 C. The device can be converted into a solar cooker for which there is provision of a two-step platform and two additional covers - one over the top of the cover and the second on the front side. As and when it is desired to cook a mid-day meal, its drying trays are removed and the two-step platform is introduced.

(*Documentation Bulletin No. 51; 1983; 16*)

224 Tray drier

J.T. Jagtiant offer tray driers for drying powders, chemicals, foodstuffs, bottles, etc.

Heating is either done by electricity or steam, or both combined. Five standard models are

available with 12, 24, 48, 96 or 192 tray capacity. The normal temperature is 120 C. Higher

temperatures upto 300 C can be offered. The

exterior and the interior are fabricated from

heavy gauge mild steel sheets, and the gap in

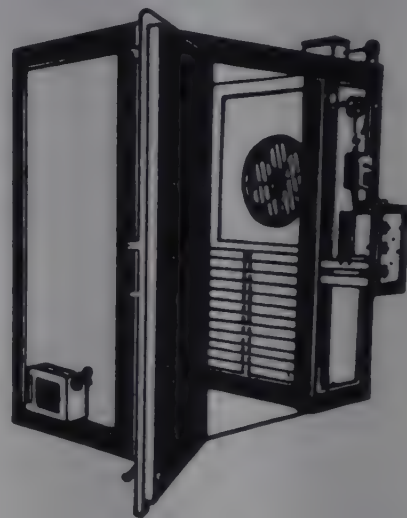
between is packed with glass wool insulation to prevent heat loss. The

interior is painted in heat resisting aluminium paint while the exterior is

in dark grey enamel. Tubular heaters are fitted on the sides of the drier

for maximum heat transfer, while steam heated models are fitted with tinned type steam radiators.

(*Industrial Products Finder 11(8); 1983; 95*)



225 Freeze dryer (Lyophilizer)

Scientific Sales Syndicate offer freeze dryers in various models. The refrigeration system is a hermetically sealed 1 ton 220 volt, single phase, 50 Hz compressor operating on freon-12 with cooling fan for quiet operation.

Condensor trap is of non-magnetic stainless steel fabrication, argon welded, dished-bottom for complete effluent removal. Refrigerant coils

are of copper bonded to outside of condensor and heavily insulated. Temperature is adjustable and is maintained automatically. Vacuum drum is of

nonmagnetic stainless steel argon welded, with 8/12 quick seal valves/ports for manifold drying, and center chamber with adjustable shelves, for

batch drying. The vacuum pump is of double stage 100 litre/minute or 200 litre/minute rotary vacuum pump with gas ballast facility giving an assured

vacuum of 1×10^3 torr on Mcleod gauge, when measured under conditions of no load.

(PFNDAI Newsletter No. 25; 1983; 2)

226 Fluid bed dryer cum cooler

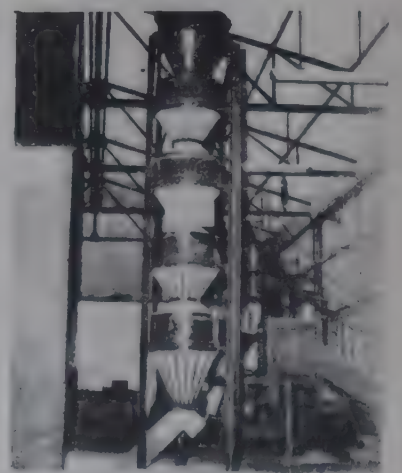
Swastika Projects have successfully developed, installed and commissioned continuous fluid bed dryers for throughputs of 250 kg/hr and above, with full and precise control of temperature, residence time and moisture content. Products which can be easily fluidized can be dried in this simple system with continuous feed and discharge in a steady stream, with facilities for zone separation for independent control zones in the same unit, depending on the sensitivity and characteristics of the product, with an additional cooling zone as well. The dryer comprises a lower section consisting of air plenum chamber in sections for the supply of conditioned air and the upper section with exhaust hoods. The fluidizing grid is arranged between upper and lower sections of the dryer, and its perforations depend on application. Advantages are higher specific (output) capacity for small drying floor area; continuous and uniform movement of material prevents quality deterioration; flexibility of temperature control; separation of sharp zone to suit each type of material; preventing material tendency to lumping and matting by constant fluidation and vibrations. Some of the products that can be dried with a variety of screen designs are coffee, peas, seeds, tobacco, fruits, etc.

(Chemical Products Finder 114); 1983)

227 Cup and cone paddy drier

Argus manufacture a paddy drier, designed and developed by the RCES-MRP Centre of Annamalai University, (Mechanical Engineering Department), Tamil Nadu. The drier has sets of cups and cones stacked one over the other with a central feed pipe for passing hot air/steam. Fed by a bucket elevator from the top of the drier the paddy is dried while passing over the cups and cones and collected in the bottom. Models of 200 kg and 1,000 kg per batch, are available.

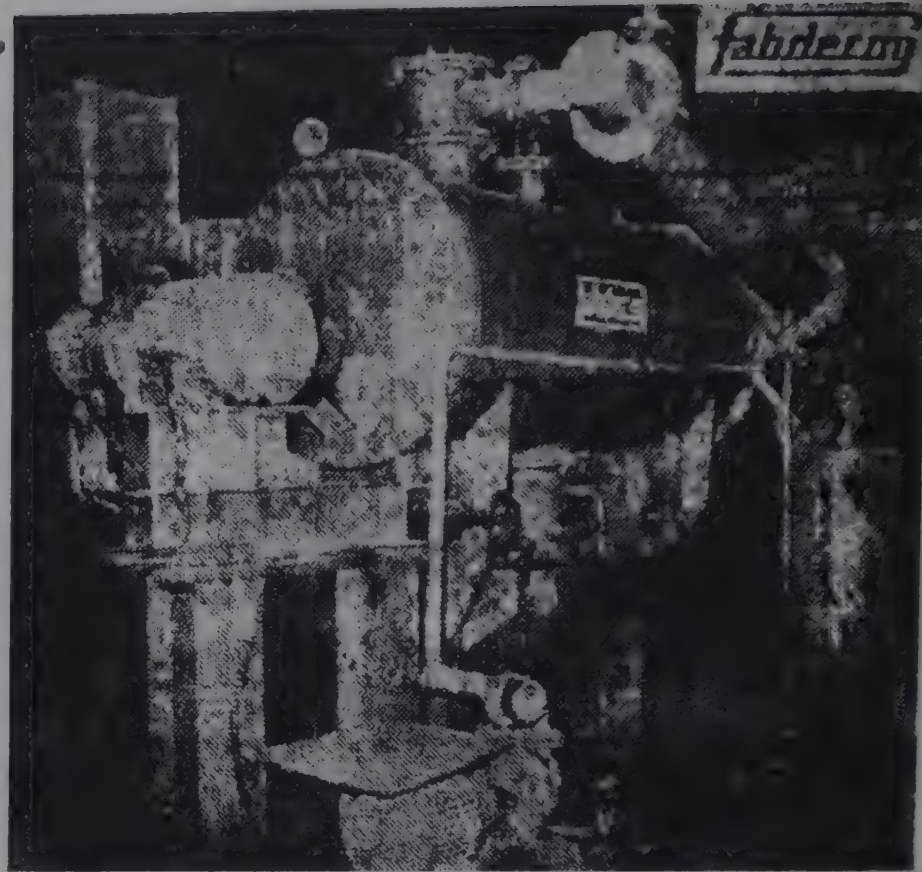
(Industrial Products Finder 11(8); 1983; 29)



228 Vacuum drying system

Fabdecon Engineers (1/18 Kailas, Sainath Nagar, Ghatkopar, Bombay-400 086) have introduced a new agitated vacuum drying system operates on the principle 'Boiling point of liquids reduces with pressure'.

This system can be effectively used for drying chemicals, pharmaceuticals, food-stuff and any other heat sensitive material requiring low temperature drying or hazardous material where the operating atmosphere has to be controlled.



In the presently available form, this system is batch operated and can be had in capacities ranging from 10 litres to 3000 litres.

(*Economic Times*, December 14, 1981; 11)

229 Snackfood drying oven

Snackfood Drying Oven features improved drying efficiency, fuel economy, and accessibility for ease of cleaning. The gas-fired oven, which is equipped with a recirculating forced convection-air system, dries extruded corn snacks at a rate of 2,700 lb/hr. The drying cycle begins with the discharge of warm air from the circulating fan into an upper supply duct. The air moves downward through the product bed and is returned through a filter to the burner chamber, where it is reheated and recycled through a balanced air system. An exhaust fan extracts moist air from the drying chamber to accelerate evaporation from the food products. Manufactured with a stainless steel insulated enclosure, the oven features a 48-in-wide conveyor and a process chamber length of 17-ft 6-in. Standard equipment includes a positive-drive conveyor, an 8-point first-out indicator for combustion-control trouble shooting, and a 200 F shut-down controller.

(*PFNDAI Newsletter* No. 16; 1983; 1)

230 Line of flexible packaging

Line of Flexible Packaging materials are produced by Crown Zellerbach using a solvent-free adhesive laminator. The laminator accommodates all gauges of films commonly used in the packaging industry, including polyester, nylon, polypropylene, polyethylene, and coextruded films, and it bonds these various films to foil, paper, and gassine substrates. Solvent-free adhesive lamination eliminates migration of solvent odours into the packaged product. The laminator improved tension-control system provides rolls that are curl- and wrinkle-free, and it allows light-gauge film to be laminated at high speeds. Solvent-free adhesive lamination also eliminates web-stretching, making it possible to bond pre-printed materials without registration difficulties.

(PFNDAI Newsletter No. 16; 1983; 1)

PACKAGING

231 Metallized bag-in-box for wine

Scholle Corporation's new metallized bag-in-box package for wine recently won a top design award in the U.S. The package features a multi-layer bag (2-mil low-density polyethylene and outer layer of metallized polyester) plus a well designed, decorated corrugated box. The bag offers a low moisture-vapour transmission rate of 0.02 grams per 100 inches² (2540 mm²) over 24-hour period. Oxygen-barrier properties are low: 0.02 cc per 2540 mm² per 24-hour. The combination keeps ambient conditions from affecting the wine and extends shelf life. The bag collapses when wine is opened, keeping air out of the bag.

(Food Engineering International 8(4); 1983; 19)

232 Packaging machinery

Samarpan manufacture a range of packaging machinery in association with Prepac, France. The form, fill, and seal machine comes in different models depending upon the product - oil, ghee, vanaspati, adhesive, free flowing powders, spices, sugar, detergent, chemicals, tablets, etc. The models are manufactured to suit a variety of packaging materials such as HMHD, polythene, polypropylene, paper laminate, aluminium laminated film, cello-poly and other virgin heat sealable film. The machine can pack 5 to

1,000 g. Overlap, fin, side and wide seal can be provided to suit requirement.

(Industrial Products Finder 11(4); 1983; 191)

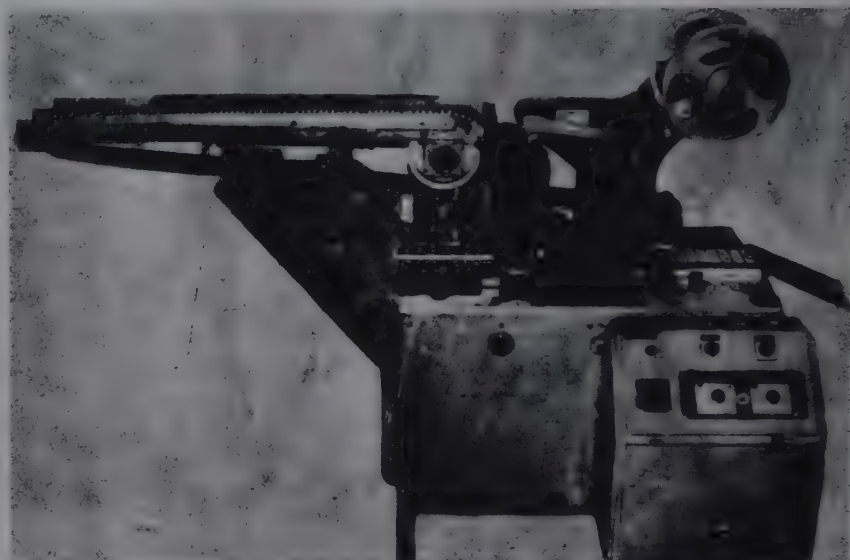
233 Fibre drum

Atlas fibre drum is made out of kraft paper, fitted with plywood/hard-board at the top and bottom and high strength galvanised iron rings. It is suitable for packing pharmaceuticals and dyestuffs, intermediates, chemicals, food products, cattle/poultry feeds, pesticides, foundry flux, plasticisers and other chemicals.

(Industrial Products Finder 11(7); 1983; 166)

234 Carton wrapping/sealing machine

Auto-wrap 120 is for wrapping and sealing of cartons with cellophane or BOPP film. The foils kept in coils are trimmed to correct size, wrapped over carton and heatsealed. Maximum power consumption is 2.2 kW. The machine can give 60-120 cartons, per minute, depending on the size and shape of the carton and is suitable for wrapping cartons used in pharmaceuticals, food products, cosmetics, tooth brush, etc.



(Industrial Products Finder 11(7); 1983; 89)

235 Cap sealing systems

Cap-sealing system provide tamper-resistant sealing for plastic, glass, and paperboard packages, including hermetic and leak-proof sealing. Available with radio frequency or solid state power supplies, the systems combine the advantages of foil inserts with induction heating. Power generation equipment may be located as far as 25 ft away from the production line using an optional remote head and transformer. Only 8-in of on-line space is required for complete installation of the work coil. Seal caps of varying sizes and bottles of varying heights can be accommodated with an adjustment of the work coil. Conveyor line rates of speed can range up to 125 ft/min. The systems are designed to work effectively on 100 V. The voltage

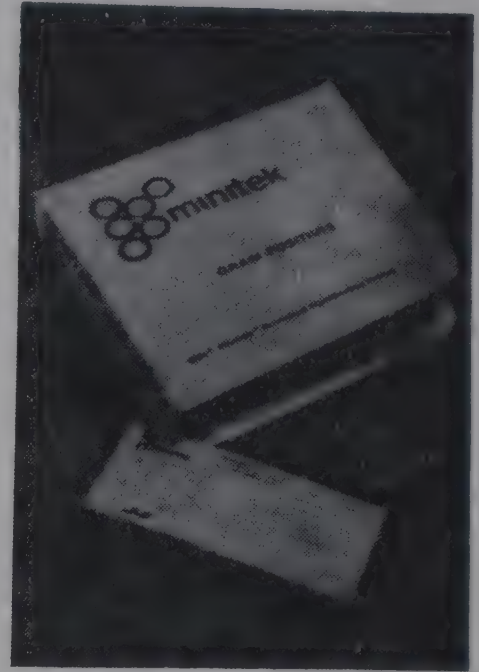
is low enough that the work coil can be submerged in water, thus facilitating wash down.

(PFNDAI Newsletter No. 16; 1983; 2)

ANALYSIS

236 Quick method for identifying microorganisms

Gram-positive cocci may be identified using the comprehensive single test MinitexTM System. The test system can be used for the identification of eighteen species of streptococci, thirteen strains of staphylococci, and eight species of micrococci. The procedure is based on biochemical methods for the differentiation of microorganisms according to their metabolism of certain substrates. Biochemical discs replace conventional media, and the procedure requires less incubation time (24 hr) compared to conventional media (48 hr or more).



(Food Technology 37(5); 1983; 208)

237 Grain moisture-cum-temperature meter with plug-in programs

A portable moisture meter with plug-in calibrated program keys measures the moisture content of a wide variety of crops in whole grain or ground form to any required standard. Called the Protimeter Digital Grain master (PDG), the instrument enables users to select the appropriate calibration for different crops, or different calibrations for the same crop, to comply with specific standards. The sample is placed in the instrument's cell and compressed. The appropriate program key is then slotted into the instrument and the 'on' button pressed. The reading appears digitally on a display panel. The instrument can be transformed into a thermometer for external use by fitting to it a plug-in calibrated temperature program key and a temperature probe. The PDG can also be used in the conventional mode without calibrated program keys.

(Invention Intelligence 18(1-2); 1983; 72)

238 Low cost protein and moisture analyser

The Inframatic 8100 NIR analyzer uses state of the art microprocessor technology to measure protein, moisture and other parameters in wheat, barley and flour in only 20 seconds.

The instrument is designed for use by unskilled operators and gives digitally displayed results at the touch of a button. An optional built in printer provides a permanent record of composition.

The sealed, compact construction of the Inframatic combined with its method of sample presentation eliminates the use of troublesome sample cells or cups and prevents sample material or dust entering the instrument. No weighing of sample is required.

Accuracy of the Inframatic 8100 is $\pm 0.2\%$ with precision better than $\pm 0.1\%$.

(Food Flavourings, Ingredients, Processing and Packaging 4(11); 1982; 49)

239 On-line oxygen head space analyzer

On-line oxygen head space analyzer
Toray LF-700D is specifically designed for use on food packaging lines which utilize gas flushing to extend product shelf life. The LF-700D also functions as a sealed package analyzer through use of a flexible package sample syringe. The LF-700D's design allows for continuous monitoring of gas flushing areas, gas streams, tanks, and enclosures. Oxygen concentrations from 0-50% can be closely monitored with alarm limits set to signal when oxygen

levels rise above selected levels. Oxygen concentration is displayed on a digital readout in % O_2 . The LF-700D features solid state circuitry with an internal pump and modular construction for easy servicing. The analyzer is portable, light-weight, and may be rack mounted. Multiple range selections increase sensitivity and readability to less than 1% O_2 .

(Food Technology 37(5); 1983; 213)



COMMERCIAL INTELLIGENCE

PRODUCTION (RAW MATERIAL)

240 Production potential of food crops in India.

A comparison of the yield obtained in National Demonstration Schemes as compared to State average is given for crops like rice, wheat, maize, bajra, jowar and groundnuts.

241 All India final estimate of arecanut, 1981-82

Area: 1000 hectares
Production: 1000 tonnes

State	Area	Production dried nuts without husk (processed nuts)
Andhra Pradesh	0.2	0.2
Assam	47.2	48.1
Karnataka	55.2	80.2
Kerala	61.2	53.0
Maharashtra	2.1	2.4
Meghalaya	6.5	4.9
Tamil Nadu	4.3	2.8
Tripura	0.7	1.0
West Bengal	3.1	0.8
Goa, Daman & Diu	1.7	1.3
Mizoram	0.4	Neg.
All India	182.6	194.7

(Agricultural Situation in India 38(3); 1983; 185)

Break-up of total production of arecanut into 'Tender & Ripe' - 1981-82

State	Production of arecanut-dried nuts without husk (processed nuts) (Thousand tonnes)	
	Tender	Ripe
Andhra Pradesh	-	0.2
Assam (E)	3.9	44.2
Karnataka	8.8	71.4
Kerala	3.3	49.7
Maharashtra	-	2.4
Meghalaya	0.5	4.4
Tamil Nadu	-	2.8
Tripura	-	1.0
West Bengal	0.2	0.6
Goa, Daman & Diu	-	1.3
Mizoram	-	Neg.
All India	16.7	178.0

(Agricultural Situation in India 38(3); 1983; 185)

242 All India final estimates of guarseed (for seed purposes only).
1981-82

State	Area : Thousand hectares Production: Thousand tonnes)	
	Area*	Production
Gujarat	137.8	32.6
Haryana	299.7	187.3
Punjab	64.0	76.7
Rajasthan	1,660.3	306.5
Uttar Pradesh**	2.1	1.4
All India	2,163.9	604.5

* - Area under guar sown for seed purposes only.

** - Date relate to 1980-81

- Note :
1. Despite reduction in area to the extent of 9.9 per cent, all-India production of guarseed in 1981-82 is higher by 6.5 per cent over 1980-81
 2. This increase in production has been reported mainly by Haryana and Punjab States. In Haryana, it is due partly to increase in area and partly to higher yield rates during 1981-82 as compared to 1980-81, whereas in Punjab this is due to increase in area.
 3. Guarseed is not grown to any appreciable extent in States/Territories not mentioned above.
 4. No information regarding crop estimates is yet available from the Government of Sikkim.

(Agricultural Situation in India 37(9); 1982; 626)

243 All India final estimate of banana, 1981-82

State	Area (Thousand hectares)	Production (Thousand tonnes)
Andhra Pradesh	18.3	316.0
Assam	25.8	338.5
Bihar	8.8	44.2
Gujarat	20.9	666.7
Karnataka	18.3	98.9
Kerala	49.6	312.3
Madhya Pradesh	9.5	201.5
Maharashtra	50.4	1,323.1
Manipur	2.0	25.7
Meghalaya	3.2	40.9
Orissa*	17.9	155.8
Tamil Nadu	47.0	824.3
Tripura	3.2	17.8
Uttar Pradesh	0.4	5.2
Andaman & Nicobar Islands	1.2	5.6
Arunachal Pradesh	0.5	1.3
Mizoram*	1.4	1.3
Pondicherry	0.2	3.8
All India	278.6	4,382.9

* - Relate to 1980-81

Note: 1. West Bengal is non-reporting for this estimate.

2. Banana crop is not grown to any appreciable extent in
States/Territories not mentioned above.

3. No information regarding crop estimates is yet available from
the Govt. of Sikkim.

(Agricultural Situation in India 38(3); 1983; 187)

244 All India final estimate of ginger, turmeric and garlic production during 1981-82

Area: '000 hectares
Production: '000 tonnes

State	Ginger		Turmeric		Garlic	
	Area	Prod.	Area	Prod.	Area	Prod.
Andhra Pradesh	1.50	2.30	23.5	60.1	1.1	2.3
Assam	-	-	7.9	4.9	-	-
Bihar	0.69	1.08	4.8	5.9	2.6	2.9
Gujarat	0.34	0.26	-	-	19.8	93.2
Haryana	0.02	0.02	-	--	0.2	3.6
Himachal Pradesh	1.87	0.97	-	-	-	-
Jammu & Kashmir	-	-	-	-	0.2	1.1
Karnataka	2.26	2.96	2.6	9.6	3.5	3.1
Kerala	14.04	35.59	4.0	7.6	-	-
Madhya Pradesh	1.82	2.24	0.5	0.4	7.0	24.9
Maharashtra	0.70	0.63	7.9	13.0	4.2	30.1
Manipur	0.43	0.12	-	-	-	-
Meghalaya	5.65	23.19	1.3	1.8	-	-
Nagaland	0.99	0.54	-	-	0.1	0.1
Orissa	3.48	3.34	22.2	20.7	14.4	35.4
Punjab	-	-	-	-	0.2	1.1
Rajasthan	0.22	0.26	0.2	0.3	2.4	8.2
Tamil Nadu	1.14	0.99	11.6	45.6	0.5	2.6
Tripura	0.56	0.79	0.9	1.4	-	-
Uttar Pradesh	0.58	3.95	0.6	0.7	3.4	11.2
West Bengal	3.10	5.06	-	-	-	-
Delhi	-	-	-	-	-	-
Mizoram	0.87	1.63	0.1	0.3	-	-
Pondicherry	-	-	-	-	-	-
Arunachal Pradesh	0.50	1.06	0.1	0.3	-	-
TOTAL	40.71	86.98	88.2	172.6	59.6	219.8

Courtesy: Directorate of Cocoa, Arecanut and Spice Development, Calicut.
(Directorate of Economics and Statistics, Ministry of Agriculture, New Delhi)

45 Production of dry cocoa beans in India

	Area (Hectare) Estimated by Central Govt.	Production (Tonnes)
1980-81	29,000	1,600
1981-82	29,000	2,200
1982-83 (Estimate)	29,000	3,000

(Economic Times July 27, 1983; 6)

46 Demand for cocoa beans by major industries units in India

	(Tonnes)				
	1981-82	1982-83	1983-84	1984-85	1985-86
1. Hindustan Cocoa Products Ltd., (Cadbury)	950	1025	1100	1200	1300
2. Kaira Dist. Milk Producer's Union (Amul)	500	670	755	775	950
3. Sathe Biscuits and Chocolate Co. Ltd.	300	350	350	350	350
TOTAL	1750	2045	2205	2424	2600

Based on official estimates.

(Economic Times July 27, 1983; 6)

247 All India final estimate of rapeseed and mustard, 1981-82

State	Area (Thousand hectares)	Production (Thousand tonnes)
Andhra Pradesh	0.6	0.1
Assam	224.0	102.7
Bihar	75.3	46.3
Gujarat	169.7	78.3
Haryana	202.0	141.0
Himachal Pradesh	6.5	1.9
Jammu & Kashmir	42.3	59.8
Karnataka	3.1	0.9
Madhya Pradesh	243.6	145.7
Maharashtra	4.6	1.6
Manipur	1.0	0.5
Meghalaya	5.6	3.4
Nagaland	2.3	0.9
Orissa	162.1	72.4
Punjab	108.0	72.0
Rajasthan	651.3	458.4
Tamil Nadu	1.0	0.3
Tripura	2.9	1.8
Uttar Pradesh	2,258.0	1,073.6
West Bengal	163.3	94.7
Arunachal Pradesh	8.7	6.1
Delhi	1.1	0.1
ALL INDIA	4,337.0	2,362.5

Rapeseed and mustard is not grown to any appreciable extent in the States/Territories not mentioned above.

Arunachal Pradesh has been included in this estimate for the first time.

No information regarding crop estimates is yet available from the Govt. of Sikkim.

(Agricultural Situation in India 37(12); 1983; 794)

248 World and Indian production and export of cardamom

	1960	1966	1972-73	1979-80
1. World production	5400	4800	4700	8000
2. World Export	2570	2190	2900	5700
3. India's production	3300	2700	3000	4500
4. India's export	1920	1560	1750	2700
5. India's production as percentage of world production	61	56	64	56
6. Indian export as percentage of world export	75	71	60	47

Sources: 1. Marketing Research Corporation of India, Survey of India's Export Potential of Spices, 1968, Vol. 11 A P.P. B88 and B 92.
2. The Cardamom Board, Cardamom Statistics, 1976, P. 68 and 1981 Part II, P. 1.

(Cardamom 15(3); 1983; 5)

249 All India crops estimates of some oilseeds, spices and tubers, 1981-82

Crop	Area (Thousand hectares)	Production (Thousand tonnes)
Groundnut (Nuts in shell)	7,447.60	7,239.10
Castorseed	557.80	302.40
Sesamam	2,520.80	524.00
Linseed	1,783.50	473.80
Sunflower	227.70	130.90
Coconut*	1,088.40	5,618.70
Pepper (Black)	109.29	29.45
Cardamom	86.80	5.40
Coriander	321.40	135.40
Potato	771.30	10,075.00
Sweet Potato	222.70	1,666.90

* - In million nuts.

(Agricultural Situation in India 38(3), 1983, 184)

250 Increase in fish production : Record exports long strides in marine fishing sector

India has registered an increase of about six per cent in marine fish landings during the current year as compared to the previous year's production of 13.78 lakh tonnes in spite of severe cyclones, which lashed Orissa, Gujarat and Maharashtra during the last monsoon and disrupted fishing activities. The total production of fish during the current year is estimated at 24.5 lakh tonnes compared to 24 lakh tonnes in 1981-82. This has helped in raising the export of marine products in 1982 to a new peak of Rs. 342 crores against Rs. 286 crores in 1981 and only Rs. 216 crores in 1980. This increase of about 20 per cent is attributed to forward looking marine fishing policy adopted in the recent past.

(Agricultural Situation in India 38(2); 1983; 91)

251 Species wise break up of prawn landings and percentages during 1981

Species	All India landings in tonnes	Percentage
Solenocera crassicornis	8,084	5.6
Penaeus indicus	7,537	5.2
P. merguensis	1,096	0.8
P. monodon	941	0.6
P. semisulcatus	7,898	5.4
Metapenaeopsis stridulans	506	0.3
Metapenaeus dobsoni	10,059	6.9
M. affinis	5,025	3.5
M. monoceros	7,073	4.9
M. brevicornis	907	0.6
M. kutchensis	857	0.6
Parapenaeopsis styliifera	29,109	20.1
P. hardwickii	2,123	1.5
Acetes indicus	38,430	26.5
Nematopalaemon tenuipes	19,698	13.6
Exopalaemon styliiferus	859	0.6
Exhippolysmata ensirostris	2,309	1.6
Other species	2,458	1.7
TOTAL	1,44,969	100.0

(Marine Fisheries Information Service No. 43; 1982; 9)

PRODUCTION (INDUSTRIAL)

252 Cost of processed foods

Product	Price	Price as % of per-capita income	
		India	U.S.A.
Infant food	30-40	2.5	0.05
Milk powder	30-35	2.0	0.04
Malted food	30-38	2.0	0.04
Corn flakes	18-25	1.0	0.02
Biscuits	15-25	1.0	0.02
Confectionery	20-28	1.5	0.03
Protein foods	40-50	3.0	0.06
Canned fruits	12-18	0.8	0.02
Frozen meat	25-30	1.5	0.03
Frozen prawns	48-60	5.0	0.10
Egg powder	80	6.5	0.13
Alcoholic beverage	80-100	7.0	0.14

(Economic Times 27 July, 1983; 6)

253 Trend in output of selected processed food items (DGTD units)

				1980	1981	1982	1982 No. of Installed units capacity	
1.	Biscuits	000 tonnes		106.0	115.0	125.0	33	147.0
2.	Confectionary	tonnes		19.2	21.2	22.5	22	35.9
3.	Bread	tonnes		139.0	145.0	152.0	21	132.0*
4.	Malt extracts			2.8	5.4	6.0	5	17.3
5.	Breakfast foods							
	i) Pear barley	tonnes		612 0	887.0	750.0	4	6590.0
	ii) Corn flakes	tonnes		290 0	328.0	400.0	3	2550.0
	iii) Oat flakes	tonnes		-	23.0	10.0	1	200.0
	iv) Macaroni Sphagetti, vermicelli, etc.	tonnes		-	-	687.00**	-	5500.0
6.	Guargum	tonnes		34.8	31.3	32.5	7	46.0
7.	Weaning food	tonnes		3.1	4.4	4.3	3	10.3
8.	High protein foods	tonnes		2.4	5.0	6.0	9	13.6
9.	Starch	tonnes		141 0	138.0	142.0	10	252.0
10.	Drinking chocolate	tonnes		54 0	281.0	300.0	3	1500.0
11.	Chocolate	tonnes		1190 0	3038.0	3100.0	5	5337.0
12.	Soft drinks	Million bottles		1434 0	1553.0	1650.0	45	2078.0
13.	Beer	000 kl		146 0	155.0	165.0	29	124.0
14.	Babyfoods	000 tonnes		41.1	41.0	43.9	15	49.0
15.	Milk powder	tonnes		n.a.	n.a.	n.a.	22	50.0
16.	Malted milk foods	tonnes		n.a.	n.a.	n.a.	9	20.4
17.	Meat products	tonnes		n.a.	n.a.	n.a.	4	1600.0

contd.

253 Contd.

		1980	1981	1982	1982 No. of installed units capacity	
18. Icecream	kl 000	n.a.	n.a.	n.a.	8	10895.0
19. Fruits & vegetable canned	tonnes	n.a.	n.a.	n.a.	31	97.0
20. Flour million	tonnes	n.a.	n.a.	n.a.	158	4993.0
21. Cheese	tonnes	n.a.	n.a.	n.a.	1	600.0

Note : The data for number of units and installed capacity for items 41 and 21 related to the year 1978.

* - After endorsed capacity for certain units.

** - Commenced production in 1982.

(Economic Times 27, July 1983; 6)

254 Alcohol production from different raw materials

Crop	Alcohol yield* (litres/tons)	Crop yield** (Tonnes/Hect.)	Alcohol production (Litre/Hect.)
Sugarcane	70	56.04	3923
Cassava'	180	8.70	1575
Sugarbeet	110	30.21	3323
Sweet sorghum	60	1.32	80
Molasses	245	-	-
Wheat	340	1.78	605
Corn (Maize)	360	3.27	1175
Barley	250	1.76	445
Potatoes	110	15.50	1705
Sweet potatoes	125	8.36	1045
Rice	430	2.67	1127

* Based on the practical experience in Brazil and U.S.A.

** World average, according to FAO Production Year Book 1979.

(Indian Sugar 32(11); 1983; 758)

255 Sugar production

According to the Indian Sugar Mills Association, sugar production during the first fortnight of August, 1983 (i.e. 1.8.83 to 15.8.83) was about 2,000 tonnes as against 21,000 tonnes during the corresponding period last year. This brings the total production till 15.8.83 for the season 1982-83 to 82,42,000 tonnes as against 83,65,000 tonnes during the corresponding period last season.

The off-take of sugar from factories during the first fortnight of August, 1983 was about 2,61,000 tonnes for internal consumption and 28,000 tonnes for exports as against 2,82,000 tonnes for internal consumption and 29,000 tonnes for exports during the same fortnight last season. The total off-take till 15.8.83 was about 55,03,000 tonnes for internal consumption and 2,52,000 tonnes for exports as against 45,83,000 tonnes for internal consumption and 3,22,000 tonnes for exports during the corresponding period last season.

The total closing stock of sugar with the factories as on 15th August, 1983 was 57,83,000 tonnes as against 42,37,000 tonnes on the same date last season.

(Indian Sugar Mills Association: Press release)

EXPORT

256 Export of fruits and vegetables doubled in one year

Exports of fresh fruits and vegetables have doubled during the first ten months of 1982-83 (April 1982 to January 1983) as compared to the corresponding period of the preceding year. This was revealed in a recent meeting of the exporters of fresh fruits and vegetables with the Commerce Secretary, Shri Abid Hussain.

Exports of fresh fruits for the first ten months of this year have been tentatively placed at 15,402 tonnes valued at Rs. 12.19 crores as compared to the export of 7,110 tonnes valued at Rs. 6.15 crores during the corresponding month of 1981-82 registering a more than 100 per cent increase. In case of fresh vegetables, the exports during the same period have been placed at 10,013 tonnes valued at Rs. 6.38 crores against the exports of 5,186 tonnes valued at Rs. 2.38 crores during the previous year. This indicates that while quantitatively the exports of fresh vegetables have been doubled, in value terms it has registered almost three-fold increase. Exports of

vegetables and fruits are placed on Open General Licence.

During the meeting with the exporters, it was pointed out that as against the total production of 50 million tonnes of fruits and vegetables in India, India's exports were only 16,000 tonnes or 0.0003 per cent of the total production. The meeting also took note of the assessment that 25 per cent of India's production of fruits and vegetables perished because of lack of marketing facilities. Exports, therefore, helped in finding out an outlet for the produce of the growers, and the processed food industry also helped in preserving and utilising fruits and vegetables to avoid glut.

The meeting noted that the Government had encouraged exports of processed fruits by giving necessary facilities to the industry. Imports of packaging material was allowed. Recently, the Ministry of Commerce allowed import of tin cans as import replenishment which helped in increasing exports of canned fruits. As a result, the exports of processed fruits had doubled during the period April to December, 1982 as compared to the corresponding period of 1981. The total exports were 57,000 tonnes valued at Rs. 50.37 lakhs.

(Agricultural Situation in India 38(1); 1983; 22-23)

257 Exports of spices and spice products from India

Commodities	Quantity: Tonnes	
	Value : '000 rupees	
	April 1982 to February 1983	
	Quantity	Value
Pepper	16692.10	218809.34
Dehydrated Green Pepper	52.27	2476.35
Pepperpowder	30.20	764.87
White pepper	1.54	58.88
Total pepper	16776.11	222109.44
Cardamom small	913.56	143676.42
Cardamom big	80.98	1630.12
Dry chillies	8482.60	83149.98
Chillies powder	1879.79	18211.73
Total chillies	10362.39	101361.71
Dry ginger	3419.64	49652.20
Ginger powder	30.49	538.86
Total ginger	3450.13	50191.06
Turmeric	4500.94	23976.14
Turmeric powder	2323.90	12623.67
Total turmeric	6824.84	36599.81

contd.

257 contd.

Commodities	April 1982 to February 1983	
	Quantity	Value
Curry powder	2518.19	30025.22
Coriander seed	5981.66	34408.50
Coriander powder	595.07	6165.79
Total coriander	6576.73	40574.29
Cumin seed	1312.61	23988.18
Cumin powder	33.08	749.00
Total cumin	1345.69	24737.18
Celery seed	1835.85	12682.17
Celery powder	3.50	19.77
Total celery	1839.35	12701.94
Fennel seed	461.32	6341.78
Fennel powder	-	-
Total fennel	461.32	6341.78
Fenugreek seed	3830.57	16148.96
Fenugreek powder	1.04	9.42
Total fenugreek	3831.61	16158.38
Garlic*	4946.02	23411.46
Dehydrated garlic*	183.61	2063.39
Garlic powder*	102.75	1314.22
Total garlic	5232.38	26789.07
Nutmeg	5.03	26.85
Mace	3.51	102.50
Cassia	351.48	4960.63
Cassia powder	0.50	10.73
Total cassia	351.98	4971.36
Aniseed	-	-
Tejpat	55.98	198.41
Tejpat powder	32.00	54.72
Total tejpat	87.98	253.13
Miscellaneous spices	1416.29	9171.91
Oils of spices	22.15	8072.55
Oleoresins of spices	181.74	30506.75
TOTAL	62281.96	766001.47

Source: Customs lists. Provisional Figures: Subject to revision;
Cardamom Small; Cardamom Board.

* Garlic and its products are now being looked after by the Processed
Foods Export Promotion Council, 105 New Delhi House, 27, Barkhamba
Road, New Delhi - 110 001.

(Spices Newsletter 17(6); 1983; 2)

258 Export of oils of spices during 1981-82

Item	Quantity (kg)	Value ('000 Rs.)
Pepper oil	8,604	1,636
Cardamom oil	792	1,468
Ginger oil	6,478	1,587
Celery seed oil	630	331
TOTAL	16,604	5,022

(Courtesy: Directorate of Cocoa, Arecanut & Spices Development, Calicut)

259 Export of oleoresins of spices during 1981-82

Item	Quantity (kg)	Value ('000 Rs.)
Pepper oleoresin	1,10,282	16,057
Capsicum oleoresin	10,055	2,803
Nutmeg oleoresin	300	34
Ginger oleoresin	9,163	2,231
Turmeric oleoresin	15,221	3,493
Celery seed oleoresin	21,435	1,624
Other spices oleoresin	600	19
TOTAL	1,67,056	26,261

(Courtesy: Directorate of Cocoa, Arecanut & Spices Development, Calicut)

260 Major products of marine exports

With a share of 70.36% in terms of quantity and 87.49% in terms of value, frozen shrimp exports which were stagnating around 51,000 tonnes for the last 5 years, registered substantial improvement during 1982-83 when exports reached the level of 55,002 tonnes.

Frozen froglegs export which stood at a record level of over 11 crores during 1981-82 declined to about 4.72 crores.

Export of frozen lobster tails touched a new peak both in terms of volume and value i.e. 749 tonnes and Rs. 6.86 crores respectively which

which showed an increase of 7.93% in terms of quantity and 33.19% in terms of value over exports during 1981-82. Increased export of cooked whole lobsters to Japan was mainly responsible for the rise in export of this item.

Exports of frozen cuttlefish/fillets during 1982-83 registered an increase of 27% in terms of quantity and 52% in terms of value over exports in the previous year.

Export of fresh/frozen fish has recorded substantial increase with almost 100% increase in terms of quantity and value. As against 6,760, tonnes valued at Rs. 9.62 crores exported in 1981-82, the exports rose to a record level of 12,847 tonnes valued at Rs. 18.87 crores during 1982-83.

Dried fish exports which were of the order of 1,022 tonnes valued at Rs. 7.4 crores during 1981-82 touched a record level of 2,597 tonnes valued at about Rs. 21 crores during 1982-83.

Exports of shark fins and fish maws declined. Exports were only 156 tonnes valued at Rs. 1.99 crores in 1982-83 as against 358 tonnes valued at Rs. 3.73 crores during 1981-82.

(Seafood newsletter 60(4); 1983; 2-3)

261 Exports of processed foods

		Q - tonnes V - Rs. in lakhs	
		1981-82	
		Q	V
1.	Mango juice	9385	499
2.	Other canned & bottled fruits	20685	1639
3.	Canned vegetables	1114	98
4.	Dehydrated vegetables	1184	154
5.	Pickles and chutneys	7004	611
6.	Fresh meat	8602	1553
7.	Frozen meat	42790	4115
8.	Canned meat	1494	318
9.	Poultry products	-	326
10.	Animal casings	175	93
11.	Confectionery & Indian sweets	103	17
12.	Biscuits	2664	266
13.	Guar gum	87872	8653
14.	Guar meal	1699	26
15.	Non-alcoholic beverages	-	1
16.	Alcoholic beverages	-	57
17.	Wheat bran	-	-
18.	Malted milk	185	138
19.	Ghee	115	42
20.	Starch & its derivatives	3853	61
		contd.	

261 contd.

	1981-82	
	Q	V
21. Papads	1543	157
22. Instant coffee	1300	1300
23. Instant tea	838	487
24. Cocoa products	679	187
25. Walnuts-in-shell	2759	224
26. Walnut kernels	4154	774
27. Mushrooms	43	278
28. Other processed foods	-	496
29. Fresh mangoes	3277	349
30. Other fresh fruits	7806	394
31. Fresh vegetables	5957	281
32. Fresh onions	166000	2950
33. Fresh potatoes	418	6
34. Basmati rice	309750	17479
35. Other rice	556793	17869
36. Barley	44000	900

(Economic Times July 27; 1983; 6)

TRADE INFORMATION

262 Progress of food processing industries in India

	Number of factories	Total employees (Nos.)	Total output (Rs. lakh)	Value added (Rs. lakh)
1973-74	13793 (+ 1.2)	699907 (+ 11.5)	341447 (+ 39.2)	32231 (+9.1)
1974-75	13729 (- 0.5)	928778 (+ 32.7)	439541 (+ 28.7)	44330 (+ 37.5)
1975-76	14441 (+ 5.2)	1051120 (+ 13.2)	495503 (+ 12.7)	47382 (+ 6.9)
1976-77	15634 (+ 8.3)	1135177 (+ 8.0)	532723 (+ 7.5)	55869 (+ 17.9)
1977-78	16156 (+ 3.3)	1200029 (+ 5.7)	630639 (+ 18.4)	66775 (+ 19.5)

Note : Figures in brackets are percentage increase or decrease over previous figures.

(Economic Times July 27; 1983; 6)

63 Cost structure in food industry

Component of expenditure	% of cost of production
Raw material	66.06
Power and fuel	2.38
Labour & supervision	9.29
Depreciation	1.38
Selling commission	1.21
Other expenses	11.24
Interest	1.46
Profit	6.98
TOTAL	100.00

(*Economic Times* July 27; 1983; 6)

64 Ginger economy in Meghalaya

Popular varieties grown, their yield rates, export potentiality, quality improvement, producer's share in the consumer's rupee and the problems of the grower are discussed in this article. Grades of ginger and marketing cost along with the margins of each agency in ginger marketing in East Khasi Hills District are given in tabular form.

(*Agricultural Situation in India* 37(12); 1983; 757-760)

65 Minimum release price of coffee refixed

Government have approved the revision and refixation of Minimum Release Price (MRP) of coffee at Rs. 5.50 per point, effective from March 1, 1983. The old MRP was Rs. 4.45 per point. The MRP was fixed at Rs. 4.80 per point with effect from April 1, 1977. This was later scaled down to Rs. 3.84 per point. However, in September, 1980, the MRP was revised and refixed at Rs. 4.45 per point on an ad-hoc basis.

(*Agricultural Situation in India* 37(12); 1983; 763)

66 Duty free imports into GCC countries

Imports of food, medicine, agricultural and industrial raw material into Gulf Co-operation Council (GCC) countries will be free of Custom duties. This decision was taken at a recent meeting of GCC countries in Riyadh. Custom duties would now be classified into three categories - tax free, taxed and protected goods. The new rates of duties on taxed goods

will vary between 4 percent and 20 percent, which will come into force on September 1, 1983.

(Cashew bulletin 20(6); 1983; 4)

267 Cash compensatory support rates on some items up

Cash compensatory support rates on soft leather equipment, animal casings, spices, oil, oleoresins, steel welded mesh and handicrafts made of metal wares and wood wares, have been raised by seven to 12 percent from May 19 to encourage exports. The decision to raise the cash compensatory support rates was taken by the Commerce Ministry following a cash assistance review meeting held here recently. The review followed an open house meeting held at the instance of the Commerce Minister, Mr. V.P. Singh, where representations for the enhancement of these rates were made by members of the trading community.

The objective of cash compensatory support is to compensate exporters for the elements of unrefunded tax and duties paid on the inputs required in the manufacture of goods exported. The Government took up an itemwise review of these last year. The revised rates of the respective commodities, effective from October 1 last, were announced and they are **valid** up to March 31, 1985. However, following representations from exporters of soft leather goods, processed food items, engineering goods, woollen carpets and handicrafts, the Commerce Ministry has once again revised the rates.

Cash compensatory support is normally available for a three-year period and there are almost 400 items which benefit from this scheme.

(The Hindu May 25, 1983; 9)

268 More time to modernise

The time-limit for conventional rice mills to change over to modern milling techniques, which is due to expire on July 29 in the case of single huller rice mills and July 31 in the case of larger units, has been extended up to July 31, 1984, according to an announcement from the Department of Food. The extension has been allowed in response to a large number of representations made to the Government by mill owners, the announcement said.

(The Hindu July 2, 1983; 6)

269 Trade enquiries for Seafoods

<u>Name of the firm</u>	<u>Commodity desired</u>
M/s. L.F.C. Lorenzana Hong Kong Ltd., Store No. 25 G/F Far East Mansion 5-6 Middle Road, Kowloon, Hong Kong	Headless: White, tiger, brown, flower and pink, various counts/ pound
Telex : 73840 AMHOC HX ATTN: ENGR SITON	Head-on : "frozen shrimp/prawn, various counts/pound basis
Phone : K-3-7239325 K-3-7213676	Peeled and Deveined: Various counts/ pound basis (including broken)
	Peeled and Undeveined: (raw peeled) various counts/pound (includ- ing broken)
	Cooked and Peeled: Various counts/ pound - including broken (no count)

(Seafood Newsletter 60(3); 1983; 19)

270 Trade enquiries for other items

M/s. Myland Enterprise, Rm. 501 Sunny House, 5th floor, 12-16 Li Yuen St, West, Central District, Hong Kong.	Foodstuff.
M/s. Rekena & CIA. Lda., AV, 29 De Agosto, 333-Terrugen-2710, Sintra, Portugal.	Equipment for the food industries.
Mr. Kingsley T. Cheung, Manager - Consumer Division, Connell Bros, Co., (HK) Ltd., Room No. 307, No.9, Ice House Street, Hong Kong	Cashew nuts, HPS groundnuts and the entire range of processed foods suitably packed for sale in super- markets.
Mr. Mak Fook Chuen, Buying Controller, Park'n Shop Ltd., G.P.O. 105, Hong Kong.	Cashewnuts, HPS groundnuts and the entire range of processed foods suitably packed for sale in super- markets.
Fintech, 132, Azimpur Road, Dacca-5, Bangladesh.	Cooking salt; in bulk, 10 to 20 thousand metric tons per month for 3 years, Fish meal; 20,000 metric tons, minimum protein content 65 per cent and free of contamination, cashewnuts; 50,000 metric tons.

contd.

270 contd.

M/s. Aziz Enterprise,
Dhanialapara,
D.T. Road,
Chittagong,
Bangladesh.

M/s. Inter-Mercat O.E., 71,
Tsimiski,
P.O.Box 1032,
Greece

M/s. Fobinter, Comercio de
Importacao, e Exportacao, Lda,
Rua Jose da Purificacao Chaves,
9-30 C, 1500 Lisboa,
Portugal.

(*Indian Export Trade J.* 36(6/7); 1982; 9-12)

Food Products.

Conserved fruits.

Foodstuffs.

271 Fruit and vegetable products

IMPORTERSJeddah

Basmah Trading Co.,
P.O. Box 427,
Jamil A Bamujally Ba Abdullah
P.O. Box 732

Ba Abdul Rahim Trading Est.,
P.O. Box 847

Al Mokhtar Stores,
P.O. Box 1220

United Arab Agencies,
At Maghrabi Buildings,
P.O. Box 1045

Abbar & Zainy,
P.O. Box 461

Arabian Food Supplies,
P.O. Box 1400

Mahmoud Ahmed Al-Maimani,
P.O.Box 3328

Ghulam Masood,
P.O. Box 324

M.U. Aziz Khan,
Tawfiq Building,
1st Floor,
P.O. Box 37

Riyadh

Al-Sadaka Trading Est.,
P.O. Box 2993

Al Sadhna Commercial Est.,
Jarir Street Near Stadium,
P.O. Box 945

Al-Tawil Food Services
P.O. Box 40205

Arab Supply & Trading Corp.,
P.O.Box 3863

National Co. for Foodstuff production,
P.O. Box 4130

Riyadh Refrigerating & Foodstuff
Trading Co. Ltd.,
P. O.Box 281, Malaz

Saudi Arabian Food Establishment,
P.O. Box 2986

Abbar & Zainy,
P.O. Box 393

Najed Trading Establishment,
P.O.Box 40

Sharga Italy Food Corp.,
P.O. Box 2050,
University Street, Malaz.

271 contd.

Daharan/Dammam

Soulo Supermarkets,
P.O. Box 200, Daharan Airport.

Muhaidik Jassim Mohammad,
P.O. Box 406, Dammam

Moajil Abdulaziz & Soad,
P.O. Box 53,
Dammam

Gosaili Cold Stores Khalifa,
P.O. Box,
Dammam

General Trading Co.,
P.O. Box 19, Daharan Airport,
At-khobar

Abdullah Abdulrahim Soadi & Co.,
P.O. Box 463,
Dammam

Abdul Hodi Abdullah Al-Qatham & Sons,
P.O. Box 20, Dammam.

Ali Trading Establishment,
P.O. Box 2487, Dammam.

(*Indian Export Trade Journal*, 36(1); 1982; 9-10)

272 Experts to study food marketing system

Twenty senior executives of food marketing agencies from 10 countries of Asia and the Pacific will begin a 10-day tour of India from tomorrow to study the food marketing system. These executives are from Malaysia, Pakistan, Philippines, Republic of Korea, Sri Lanka, Thailand, Indonesia, Nepal and India, all members of the recently formed Association of Food Marketing Institutions in Asia and the Pacific (AFMA) with headquarters in Bangkok. Mr. Ajit Singh, Managing Director, Food Corporation of India (FCI) is the Chairman of the association. The tour has been organised by the FCI to enable inter-change of information and experiences and stimulate technical and economic cooperation among the marketing institutions of the countries of this region.

(*The Hindu*. October 24, 1983; 6)

TRANSFER OF TECHNOLOGY AND NEW INDUSTRIES

273 N.R.D.C. to help villages

The National Research Development Corporation of India (NRDC) has in collaboration with the Department of Science and Technology launched a new scheme of development and promotion of technology suited to rural areas. Under the scheme, NRDC would set up demonstration units and provide basic technologies needed by the people, for things like health, housing, inexpensive sources of energy, safe drinking water, generation of employment for women and reducing their drudgery. The demonstration units would

be set up on permanent basis and initially two pilot projects would be set up - one at Padruna in Uttar Pradesh and the other at Imphal in Manipur at a cost of Rs. two lakh each. More such units would be set up in other parts of the country in the near future.

(Agricultural Situation in India 37(12); 1983; 764)

274 Iron fortified salt unit in Tamil Nadu proposed

A proposal to set up a large-scale unit to produce annually 1,500 tonnes of iron fortified salt in collaboration with the Tamil Nadu Government is under the Centre's consideration, the Deputy Health and Family Welfare Minister, Miss. Kumud Joshi, told Mr. Sushil Bhattacharya in the Lok Sabha today.

(The Hindu August 19; 1983; 6)

275 New boiled rice variety is highly nutritious

People in southern and eastern states will soon be having a more nutritive variety of sela (parboiled) rice produced in Punjab and Haryana. The Food Corporation of India has just introduced a new scientific technique of preparing sela from paddy. The pressure parboiling technique, as it is called, is not only efficient and economical but also makes the grain more nutritive. The technique was developed by FCI's rice mill at Karnal. Though not in much demand in wheat-eating north, sela is much in demand in States where rice is the staple food. Even in the north, sela is preferred to polished rice and basmati.

By the new technique, introduced at Karnal two months ago, four tonnes of sela can be turned out an hour. Two more such units are to be started soon at Batala and Patiala in Punjab. Latest method: The pressure parboiling process is the latest technological advance in the field of parboiling of paddy. The raw paddy is wetted, not soaked as in the CFTRI process which was widely adopted in modern rice mills. Gelatinisation is achieved by steaming the wet paddy under pre-determined and controlled steam pressure. The CFTRI method used steam of higher pressure (50 to 60 lb a square inch), but the new process uses a lower steam pressure of 20 lb a sq. inch.

The yield is three per cent greater than the old method, moreover, nearly 20 per cent of energy is saved. A substantial saving, and instead of costly fuel oil husk can be used. It ensures complete gelatinisation

of starch resulting in improved cooking quality and there is no discolouration of grain. Highly polished rice, especially pearl white rice, most sought after in the north has no food value except starch. FCI is setting up such units at a number of places, including one at Thanjavur.

(The Hindu August 5; 1983; 16)

FOOD REGULATION, QUALITY CONTROL AND HYGIENE

REGULATION

276 Prevention of Food Adulteration (Second Amendment) Rules, 1983.

G.S.R. 249(E) - Whereas certain draft rules further to amend the Prevention of Food Adulteration Rules, 1955, were published as required by sub-section (1) of section 23 of the Prevention of Food Adulteration Act, 1954 (37 of 1954) hereinafter referred as said Act with the notification of the Government of India in the Ministry of Health and Family Welfare (Department of Health) No. G.S.R. 30 dated 23rd December, 1981 at pages 64-65 in the Gazette of India, Part II, Section 3, Sub-Section (i) dated 9th January, 1982 inviting objections and suggestions from all persons likely to be affected thereby before the expiry of ninety days from the date on which the copies of the Official Gazette in which the said notification was published, were made available to the notice.

And, whereas the copies of the said Gazette were made available to the public on 9th January, 1982;

And, whereas the objections and suggestions received from public on the draft rules have been considered by the Central Government;

Now, therefore, in exercise of the powers conferred by sub-section (1) of section 23 of the said Act, the Central Government, after consultation with Central Committee for Food Standards, hereby makes the following rules further to amend the Prevention of Food Adulteration Rules, 1955, namely:-

1. These rules may be called Prevention of Food Adulteration (Second Amendment) Rules, 1983.
2. In the Prevention of Food Adulteration Rules, 1955 (hereinafter referred to as said rules):-
 - (i) After rule 61-B, the following shall be inserted, namely:

"61-C - Use of Emulsifying and stabilizing agents in Fruit Products:-

The following emulsifying and stabilising agents may be added to fruit products:

1. Pectin
2. Sodium alginate
3. Calcium alginate
4. Alginic acid
5. Propylene glycol alginate".

- (ii) In appendix 'B' to the said rules in item No.A, 16.01, A.16.02, A.16.03, A.16.04, A.16.05, A.16.06, A.16.07, A.16.09, A.16.11 and A.16.12, the following shall be added at the end, namely:
 "It may also contain permitted emulsifying and stabilising agents as prescribed in rule 61-C".

(Gazette of India (Extraordinary) Part II, Section 3, subsection (i), March 8, 1983; 2)

277 Prevention of Food Adulteration (Fourth Amendment) Rules, 1983

1. (1) These rules may be called the Prevention of Food Adulteration (Fourth Amendment) Rules, 1983.

- (2) They shall come into force on the date of their publication in the Official Gazette except rule 4 which shall come into force after a period of two years from the date of publication of the notification.

2. In the Prevention of Food Adulteration Rules, 1955 (hereinafter referred to as the said rules) to rule 36, the following proviso shall be added, namely:

"Provided that the height of the types used in the declaration having an area not greater than 25 square centimeters, shall not be less than 1.0 mm".

3. To rule 37-A of the said rules, before the Explanation, the following proviso shall be added, namely:

"Provided that the labels of artificial flavouring substances may not declare the chemical names of flavours under this rule. In case of natural flavouring substances or nature-identical flavouring substances, the common name of flavour shall be mentioned on the label."

4. After rule 48-B of the said rules, the following rule shall be inserted, namely:-

"48-C - Sale of Food Additives:- The following food additives permitted for use in certain foods shall be sold only under the Indian Standards Institution (Certification marks, namely:-

1. Sulphuric acid (Food Grades)
2. Sodium propionate (Food Grade)
3. Calcium propionate (Food Grade)
4. Sorbic acid (Food Grade)
5. Potassium metabisulphite (Food Grade)
6. Sodium metabisulphite (Food Grade)
7. Sorbitol (Food Grade)
8. Benzoic acid (Food Grade)
9. Sodium benzoate (Food Grade)
10. Fumaric acid (Food Grade)
11. Sodium carboxymethyl cellulose (Food Grade)
12. Sodium alginate (Food Grade)
13. Agar Agar (Food Grade)
14. Alginic acid (Food Grade)
15. Calcium alginate (Food Grade)
16. Gelatin (Food Grade)
17. Ascorbic acid (Food Grade)
18. Butylated Hydroxy Toluene (BHT) (Food Grade)
19. Butylated Hydroxy Anisole (BHA) (Food Grade)
20. Caramel (Food Grade)
21. Annatto "colour." (Food Grade)

5. In rule 59 of the said rules, after item 10 of the first proviso, the following item shall be inserted, namely:

"Tertiary butyl hydro quinone (TBHQ) - 0.02 per cent."

6. After rule 62 of the said rules, the following rule shall be inserted, namely:-

"63-A - Antifoaming agents in edible oils and fats: Dimethyl Polysiloxane, food grade, may be used as an antifoaming agent in edible oils and fats for deep fat frying upto a maximum limit of 10 parts per million."

Explanation : For the purpose of this rule, "Antifoaming agent means substance which retards deteriorative changes and foaming height during heating."

7. In part XIII - Flavouring Agents:-

(i) Rule 63 to the said rules shall be renumbered as rule 63-A, and before rule 63-A as so renumbered, the following rule shall be inserted, namely:-

"63-Flavouring agents:- Flavouring agents include flavour substances, flavour extracts or flavour preparations, which are capable of imparting flavouring properties, namely taste or odour or both to food. Flavouring agents may be of following three types:-

(A) Natural Flavours and Natural Flavouring Substances:

"Natural flavours" and "Natural flavouring substances" are flavour preparations and single substance respectively, acceptable for human consumption, obtained exclusively by physical processes from vegetable, sometimes animal raw materials either in their natural state or processed, for human consumption.

(B) Nature Identical Flavouring Substances:

Nature-identical flavouring substances are substances chemically isolated from aromatic raw materials or obtained synthetically they are chemically identical to substances present in natural products intended for human consumption, either processed or not.

(C) Artificial Flavouring Substances:

Artificial flavouring substances are those substances which have not been identified in natural products intended for human consumption either processed or not".

8. After Part XIII of the said rules, the following Part shall be inserted, namely:-

"Part XIII A - Carry over of Food Additive 64-C-Carry over of Food Additives :-

(1) For the purpose of the standards specified in Appendix B, the "Carry Over" principle applied to the presence of additives such as colours, flavouring agents, antioxidants, anti-caking agents, emulsifying and stabilizing agents and preservative in food, as a result of the use of raw material or other ingredients in which these additives were used. The presence of contaminants is not covered by this purpose.

(2) The presence of an additive in food through the application of the carry over principle is admissible in general unless

otherwise specifically prohibited in the rules or in Appendix B provided the total additive including the carry over through the raw material or other ingredients does not exceed the maximum amount so permitted."

(Gazette of India (Extraordinary) Part II, Section 3, subsection (i); 1983; 4-5)

278 Orange (Export) Grading and Marketing Rules, 1983

G.S.R. 317 - Whereas a draft of the Oranges (Export) Grading and Marking Rules, 1982, was published as required by section 3 of the Agricultural Produce (Grading and Marking) Act, 1937 (I of 1937), at pages 818 to 822 of the Gazette of India, Part II, Section 3, sub-section (i), dated the 3rd April, 1982, with the notification of the Government of India in the Ministry of Rural Development No. G.S.R. 344, dated the 22nd March, 1982, inviting objections and suggestions from all persons likely to be affected thereby before the expiry of the period of forty five days from the date of publication of the said notification in the Official Gazette;

And whereas the copies of the said Gazette were made available to the public on the 22nd April, 1982;

And whereas no comments/suggestions have been received from the public in respect of the said draft by the Central Government;

Now, therefore, in exercise of the powers conferred by section 3 of the said Act, the Central Government hereby makes the following rules.

RULES

1. Short title, application and commencement - (1) These Rules may be called the Oranges (Export) Grading and Marking Rules, 1983.

(ii) They shall apply to Oranges produced in India.

(iii) They shall come into force from the date of their publication in the Official Gazette.

2. Definitions - In these rules, unless the context otherwise requires,-

(1) "Agricultural Marketing Adviser" means the Agricultural Marketing Adviser to the Government of India;

(2) "Authorised packer" means a person or a body of persons who has been granted a certificate of authorisation by the Agricultural Marketing Adviser, for getting the commodity graded and agmarked in accordance with grade standards and procedure prescribed under the rules;

(3) "Schedule" means a Schedule appended to these rules.

3. Grade designations - The grade designations to indicate the quality of the oranges shall be as set out in column 1 of the Schedules I to V.

4. Definition of quality - The quality indicated by the grade designations shall be as set out against each grade designation in column 2 and 3 of the Schedules I to V.

5. Grade designation mark - The grade designation mark shall consist of a label specifying the grade designation and bearing a design consisting of an outline map of India with the word AGMARK and figure of the rising sun with the words "Produce of India" and भारतीय उत्पाद resembling the mark as set out in Schedule VI.

6. Method of packing - (1) Oranges shall be packed in corrugated card-board carton or wooden crate or basket or any other type of container and in such manner as may be specified from time to time by the Agricultural Marketing Adviser.

(2) Packing material shall be clean and dry, free from fungus and insect attack and obnoxious smell.

(3) Each package shall contain oranges of the same variety and of the same grade designation and the top layer shall be representative of the entire contents of the package in respect of size, maturity, colour, shape and freedom from visible defects.

(4) Each package shall be securely closed and sealed in the manner prescribed by the Agricultural Marketing Adviser.

7. Method of marking - (1) The grade designation mark shall be securely affixed to each case/package in a manner approved by the Agricultural Marketing Adviser.

(2) In addition to the grade designation mark, the following particulars shall also be clearly marked on the label or container, or both on label and container:

- (i) name of the variety/type;
- (ii) net weight;
- (iii) name of the packing station;

(iv) date of packing; and

(v) any other particulars, as may be specified by the Agricultural Marketing Adviser from time to time.

(3) The authorised packer may, after obtaining the prior approval of the Agricultural Marketing Adviser, mark his private trade mark on a container in a manner approved by the said officer, provided that the private trade mark does not represent a quality or grade of oranges different from that indicated by the grade designation mark affixed to the container in accordance with these rules.

SCHEDULE I

(See rules 3 and 4)

Grade designations and definition of quality of oranges (Tight shinned) MALTA-TYPE

Grade designation	Definition of quality special characteristic Diameter in millimeters** (minimum)	General characteristics
1	2	3
Extra special Special Good	80 75 70	The Oranges shall:- (a) @by carefully picked, firm, sound, clean and intact and have reached a stage of maturity which will permit the subsequent completion of ripening in the ordinary course of transport and marketin without appreciable loss of firmness; (b) @be of reasonably uniform colour throughout the pack. No orange shall be entirely green; (c) @have the shape normal to the variety and be free from malformation; (d) be free from defects due to diseases or insects or mechanical injury or sunburn or spray damage or bruising affecting the quality of the fruit materially. The fruits shall also be free from any off-flavour and abnormal taste; (d) have good keeping quality and be reasonably well developed; (f) not have coarse corrugated skin. Wind falls and shrivelled fruits shall not be* allowed for packing. The stalk shall be removed close to the fruit but not pulled out.

Malta type : The fruit is round to slightly oblong in shape and orange red/deep red in colour. It has smooth and finely pitted surface with broad and rounded apex and base, medium thick and leathery rind. The flesh is light yellow with plentiful, fine grained, good flavoured juice with sweetness and acidity, well balanced. The flesh of bloodred malta is orange coloured with red streaks.

**A tolerance of 10 per cent shall be allowed for accidental errors in respect of oranges corresponding size specification in the next lower grade.

@ A tolerance of 5 per cent shall be allowed in any one package to cover accidental errors in grading.

SCHEDULE II

(See rules 3 and 4)

Grade designation and definition of quality of oranges (Tight skinned)
MOSAMBI TYPE*

Grade designation	Definition of quality special characteristic Diameter in millimetres** (Minimum)	General characteristics
1	2	3
Extra		The oranges shall:-
special	75	(a) @be carefully picked, firm, sound, clean & intact
Special	70	and have reached a stage of maturity which will
Good	65	permit the subsequent completion of ripening
		in the ordinary course of transport and marketing
		without appreciable loss of firmness;
		(b) @be of reasonably uniform colour throughout
		the pack. No orange shall be entirely green;
		(c) @have the shape normal to the variety and be
		free from malformation;
		(d) *be free from defects due to diseases or insects
		or mechanical injury or sunburn or spray damage,
		or bruising affecting the quality of fruit
		materially. The fruits shall also be free from
		any off flavour and abnormal taste;
		(e) have good keeping quality and be reasonably well
		developed and have atleast more than half smooth
		surface;

contd.

contd.

1	2	3
		(f) not have a coarse corrugated (Godhadi) skin, windfalls and shrivelled fruits shall not be allowed for packing. Oranges of the new crop shall not be mixed with old crop. The stalk shall be removed close to the fruit but not pulled out.

*Mosambi type : The fruit is oblong with light yellowish/orange colour. The fruit is with rough surface, leathery rind creased with streaks running from apex to base, round base, broad apex solid axis. The flesh is whitish to pale yellow, very sweet with low acidity. The juice is abundant and fine grained with the acidity not well blended with sweetness.

**Fruits exceeding with diameter given against Extra Special by 6 mm shall be excluded. A tolerance of 10 per cent shall be allowed for accidental errors in grading in respect of oranges corresponding with the size specifications in next lower grade.

@ A tolerance of 5 per cent shall be allowed in any one package to cover accidental errors in grading.

SCHEDULE III

(See rules 3 and 4)

Grade designation and definition of quality of orange (Tight skinned)

SATHGUDI TYPE

Grade designation	Definition of quality special characteristic Diameter in millimetres** (Minimum)	General characteristics
1	2	3

Extra special	90
Special	85
Good	75

The oranges shall:
(a) @ be carefully picked, firm, sound, clean and in tact and have reached a stage of maturity which will permit the subsequent completion of ripening in the ordinary course of transport and marketing without appreciable loss of firmness;

contd.

contd.

1	2	3
		(b) @be of reasonably uniform colour throughout the pack. No orange shall be entirely green; (c) @have the shape normal to the variety and be free from malformation; (d) be free from defects due to diseases or insects or mechanical injury or sunburn, or spray damage or bruising affecting the quality of fruit materially. The fruit shall also be free from any off flavour and abnormal taste; (e) have good keeping quality and be reasonably well developed. Windfalls and shrivelled fruits and those having coarse corrugated skin shall not be packed. The stalk shall be removed close to the fruit but not pulled out.

*Sathgudi type : The fruit is oblong with light orange colour and smooth, finally pitted surface. The fruit is with rounded base and apex, slightly rough rind, leathery and well define segments and thick membranes. The flesh is whitish in colour and the juice is abundant, sweet and good flavoured. The axis is semi-hollow and the sweetness and acidity are not well blended.

** A tolerance of 10 per cent shall be allowed for accidental errors in grading in respect of oranges corresponding with the size of specification in the next lower grade.

@ A tolerance of 5 per cent shall be allowed in any one package to cover accidental errors in grading.

SCHEDULE IV

(See rules 3 and 4)

Grade designations and definition of quality of Mandarins* (Sangtras or santras) BATTIDAR VARIETY

contd.

contd.

Grade designation	Definition of quality special characteristic Diameter in millimeters** (Minimum)	General characteristics
1	2	3
Extra special	75	The oranges shall: (a) @be carefully picked, firm, sound, clean and intact and have reached a stage of maturity which will permit the subsequent completion of ripening in the ordinary course of transport and marketing; (b) @be of reasonably uniform colour throughout the pack. No orange shall be entirely green; (c) @have the shape normal to the variety and be free from malformation; (d) be free from defects due to diseases or insects or mechanical injury or sunburn or spray damage or bruising affecting the quality of fruit materially, the fruit shall also be free from any off-flavour and abnormal taste; (e) have good keeping quality and be reasonably well developed. Windfalls and shrivelled fruits shall not be packed. The stalk shall be removed close to the fruit but not pulled out.
Special	70	
Good	65	

Mandarins : The fruit is found in shape and flattened at both the ends. The rind is thin, smooth shiny and adheres slightly and can be easily removed from it. The centre of the fruit is hollow and the sections are easily separated from the another.

**A tolerance of 10 per cent shall be allowed for accidental errors in grading in respect of Mandarins corresponding with the size specification of the next lower grade.

@ A tolerance of 5 per cent shall be allowed in any one package to cover accidental errors in grading.

contd.

SCHEDULE V
(See rules 3 and 4)

Grade designations and definition of quality of Mandarin* (Sangtras or Santras) COORG (Loose jacket) Variety

Grade designation	Definition of quality Special characteristic Diameter in millimetres** (Minimum)	General characteristics
1	2	3
Extra special	85	The oranges shall: (a) @be carefully picked, firm, sound, clean and intact and have reached a stage of maturity which will permit the subsequent completion of ripening in the ordinary course of transport and marketing; (b) @be of reasonably uniform colour throughout the pack. No orange shall be entirely green; (c) @have the shape normal to the variety and be free from malformation; (d) be free from defects due to diseases or insects or mechanical injury or sun burn or spray damage or bruising affecting the quality of fruit materially. The fruit shall also be free from any off-flavour and abnormal taste; (e) have good keeping quality and be reasonably well developed. Windfalls and shrivelled fruit shall not be packed. The stalk shall be removed close to the fruit but not pulled out.
Special	75	
Good	70	

Manderins* : The fruit is round in shape and flattened at both the ends. The rind is thin, smooth, shiny and adheres slightly and can be easily removed from it. The centre of the fruit is hollow and the sections are easily separated from one another.

**A tolerance of 10 per cent shall be allowed for accidental errors in grading in respect of Mandarins corresponding with the size specifications in the next lower grade.

@A tolerance of 5 per cent shall be allowed in any one package to cover accidental errors in grading.

SCHEDULE VI

(See Rule 5)

Grade Designation Mark



(Gazette of India Part II, Section 3, subsection (i), April 16, 1983; 964-967)

279 Tamarind Seeds and Powder Grading and Marketing Rules, 1983

1. Short title, application and commencement - (1) These rules may be called the Tamarind Seeds and Powder Grading and Marking Rules, 1983.

(2) They shall apply to Tamarind Seeds and powder produced in India.

(3) They shall come into force on the date of their publication in the Official Gazette.

2. Definitions - In these rules, unless the context otherwise requires-

(1) "Agricultural Marketing Adviser" means the Agricultural Marketing Adviser to the Government of India.

(2) "Schedule" means a Schedule appended to these rules;

(3) "Authorised packer" means a person or body of persons who has been granted a Certificate of Authorisation by the Agricultural Marketing Adviser, for getting the commodity graded and Agmarked in accordance with the grade standards and procedure prescribed under the rules;

(4) "Certificate" means Certificate of Authorisation.

3. Grade designation - The grade designations to indicate the quality of the Tamarind Seeds and Powder shall be as set out in column I of Schedule I and II.

4. Definition of quality - The quality indicated by the grade designations shall be as set out against each grade designation in columns 2 to 6 of the Schedule I and II.

5. Grade designation mark - The grade designation mark shall consist of a label specifying the grade designation and bearing a design consisting of an outline map of India with the word "AGMARK" and figure of the rising sun with the words "Produce of India" and 'भारतीय उत्पाद' resembling the mark as set out in Schedule III.

6. Method of packing - (1) Tamarind seeds and powder shall be packed in gunny bags of polythene bags or any other type of container and in such manner as may be specified from time to time by the Agricultural Marketing Adviser.

(2) Packing material shall be clean and dry, free from fungus and insect attack and obnoxious smell.

(3) Each package shall contain the Tamarind Seeds and Powder of the same grade designation.

(4) Each package shall be securely closed and sealed in the manner prescribed by the Agricultural Marketing Adviser.

7. Method of marking - (1) The grade designation mark shall be securely affixed to each case or package in a manner approved by the Agricultural Marketing Adviser.

(2) In addition to the grade designation mark, the following particulars shall also be clearly marked on the label and/or container:

(a) date of packing;

(b) net weight; and

(c) any other particulars, as may be specified by the Agricultural Marketing Adviser, from time to time.

(3) The authorised packer may, after obtaining the prior approval of the Agricultural Marketing Adviser, mark his private trade mark on a container in a manner approved by the said officer, provided that the private trade mark does not represent a quality or grade of the Tamarind Seeds and Powder different from that indicated by the grade designation mark affixed to the container in accordance with these rules.

SCHEDULE I

(See rules 3 and 4)

Grade designation and definition of quality of undecorticated and decorticated Tamarind Seeds

Grade designation	Definition of quality				General characteristics
	Special characteristics				
	Extraneous matter per cent by weight	Damaged and discoloured, per cent by weight	Weight, per litre in gms.	Moisture per cent by weight	
	(Maximum)	(Maximum)	(minimum)	(Maximum)	
1	2	3	4	5	6
Special	1.0	2.0	900.0	9.0	The tamrind seeds:
A	2.0	5.0	800.0	10.0	(1) shall be obtained from the dried ripe and mature fruits of <i>Tamarindus indica</i> ; (2) decorticated shall be obtained by removing black brown skin of the seeds and be white in colour; (3) Undecorticated shall be with brown/black seed coat;

contd.

contd.

1	2	3	4	5	6
					(4) shall be free from live insect infestation; visible mould attack, rodent excreta, artificial colouring and polishing, obnoxious smell, deleterious substances and other impurities except to the extent provided under special characteristics.

Definitions:

- (1) Extraneous matter: Shall consist of stones, dust, dirt, parts of fruits such as rind, fibrous skeleton and/or any other foreign material.
- (2) Damaged and discoloured: Shall be the seeds, which are damaged or attacked by the insects/weavils, mould and/or showing internal discolouration materially affecting the quality.

SCHEDULE II

(See rules 3 and 4)

Grade designation and definition of quality of Tamarind Seed powder

Grade designation	Definition of quality				General characteristics
	Special characteristics				
	Starch content per cent by weight (Min.)	Total ash* per cent by weight (Max.)	Acid insoluble ash per cent by weight (Max.)	Moisture per cent by weight (Max.)	
1	2	3	4	5	6
Special	55.0	3.0	0.5	9.0	The tamarind seed powder shall be:- 1. obtained by milling decorticated white tamarind seed or <i>Tamarindus indica</i> ; 2. free from insect infestation, mould attack, insect, rodent excreta, artificial colouring and polishing, obnoxious odour and any other deleterious substances; and 3. the powder shall pass through 300 I.S. micron sieve and not more than 2% residue shall be left on the sieve.
A	40.0	3.0	0.5	11.0	

*On moisture-free basis.

(Gazette of India Part II, Section 3, subsection (i); February 5, 1983; 312-314)

280 Cotton Seeds Grading and Marking Rules, 1982

1. Short title, application and commencement:- (1) These rules may be called the Cotton Seeds Grading and Marking Rules, 1982.

(2) They shall apply to cotton seeds produced in India.

(3) They shall come into force on the date of their publication in the official gazette.

(2) Definitions: In these rules the context otherwise requires:

(1) "Agricultural Marketing Adviser" means the Agricultural Marketing Adviser to the Government of India;

(2) "Schedule" means a Schedule appended to these rules;

(3) "Authorised packer" means a person or a body of persons who has been granted a Certificate of Authorisation by the Agricultural Marketing Adviser for getting the commodity graded and agmarked in accordance with grade standards and procedure prescribed under the rules;

(4) "Certificate" means Certificate of Authorisation.

3. Grade designations: The grade designation to indicate quality of the cotton seeds shall be as set out in column I of Schedule I.

4. Definition of quality - The quality indicated by the grade designations shall be as set out against each grade designations shall be as set out against each grade designation in columns 2 to 8 of Schedule I.

5. Grade designation mark - The grade designation mark shall consist of a label specifying the grade designation and bearing a design consisting of an outline map of India with the word "AGMARK" and figure of the rising sun with the words "Produce of India" and 'भारतीय उत्पाद' resembling the mark as set out in Schedule II.

6. Method of marking - (1) The grade designation mark shall be securely affixed to each package in a manner approved by the Agricultural Marketing Adviser.

(2) In addition to the grade designation, the following particular shall also be clearly marked on the label:-

(a) Date of packing;

(b) Lot number;

(c) Net weight, and

(d) Any other particulars, as may be specified by the Agricultural Marketing Adviser from time to time.

(3) The authorised packer may, after obtaining the prior approval of the Agricultural Marketing Adviser, mark his private trade mark on a container in a manner approved by the said Officer, provided that the private trade mark does not represent a quality or grade of Cotton Seed different from that indicated by the grade designation mark affixed to the container in accordance with these rules.

7. Method of packing - (1) Cotton seeds shall be packed in new B - Twill jute bags or any other type of container and in such capacity and in such manner as may be specified from time to time by the Agricultural Marketing Adviser.

(2) Packaging material shall be clean and dry, free from fungus contamination and insect infestation and obnoxious smell.

(3) Each package shall contain seeds of the same variety and of the same grade designation.

(4) Each package shall be securely closed and sealed in the manner prescribed by the Agricultural Marketing Adviser.

SCHEDULE I

(See rule 3 and 4)

Grade designation and definition of quality of Cotton Seeds

Grade designation	Definition of quality						General characteristics
	Special characteristics						
	Percent by weight (Maximum)						
	Foreign matter	Damaged seeds	Immature, shrivelled & dead seeds	Weevilled seeds	Linters	Moisture	
1	2	3	4	5	6	7	8
I	1.0	1.0	2.0	0.5	4.0	10.0	The Cotton seed shall: (1) be obtained from the plant of <i>Gossypium</i> species; (2) be well developed, mature, clean and dry; (3) be reasonably uniform in shape, size and colour; (4) be free from dirt, obnoxious smell, deleterious substances, insect infestation, visible mould attack and rodent contamination except to the extent provided under Special Characteristics.
II	3.0	2.0	4.0	1.0	6.0	10.0	
III	5.0	4.0	6.0	1.5	10.0	10.0	

Definitions:

1. Foreign matter: shall be stones, lumps of earth, straw, chaff, stems, any other edible or non-edible seeds or any other foreign material.
2. Damaged seeds : shall be the seeds which are internally damaged or discoloured or broken materially affecting the quality.
3. Immature shrivelled and dead seeds : Shall be the seeds not properly **developed** and/or shrunk. Dead seeds shall be those seeds which can easily be crushed, if crushed between two fingers.
4. Weevilled seeds : shall be seeds which are wholly or partly bored or eaten by the weevils.
5. Linters : shall be the seeds with adhered fuzz or short lint.

(Gazette of India Part II, Section 3, subsection (i), 15 January, 1983; 141-142)

281 Niger Seed Grading and Marking Rules, 1982

1. Short title, application and commencements - These rules may be called the Niger Seeds Grading and Marking 1982:-

- (1) They shall apply to the Niger Seeds produced in India;
- (2) They shall come into force on the date of their publication in the Official Gazette.

2. Definition - In these rules, unless the context otherwise requires:-

- (1) "Agricultural Marketing Adviser" means the Agricultural Marketing Adviser to the Government of India;
- (2) "Schedule" means a Schedule appended to these rules.
- (3) "Authorised packer: means a person or a body of persons who has been granted a certificate of authorisation by Agricultural Marketing Adviser, for getting the commodity graded and Agmarked in accordance with the grade standards and procedure prescribed under the rules;
- (4) "Certificate" means Certificate of Authorisation.

3. Grade designations - The grade designations to indicate the quality of the Niger Seeds shall be as set out in column 1 of Schedule I.

4. Definition of quality - The quality indicated by the grade designations shall be as set out against each grade designation in columns 2 to 7 of Schedule I.

5. Grade designation mark: The grade designation mark shall consist of a label specifying the grade designation and bearing a design consisting of outline map of India with the word "AGMARK" and figures of the rising sun with the words "Produce of India" and भारतीय उत्पाद resembling the mark as set out in Schedule II.

6. Method of packing:

- (1) Niger seeds shall be packed in B-T with Jute gunny bags or any other type of container and in such a manner as may be specified from time to time by the Agricultural Marketing Adviser.
- (2) Packing material shall be clean and dry, free from fungus, insect attack and obnoxious smell.
- (3) Each package shall contain the Niger seeds of the same variety and of the same grade designation.
- (4) Each package shall be securely closed and sealed in the manner prescribed by the Agriculture Marketing Adviser.

7. Method of Marking:

- (1) The grade designation mark shall be securely affixed to each case/package in a manner approved by the Agricultural Marketing Adviser.
- (2) In addition to the grade designation the following particulars shall also be clearly marked on the label or container or both on label and container:
 - (a) Date of Packing;
 - (b) Name and address of packer;
 - (c) Net weight; and
 - (d) Any other particulars, as may be specified by the Agricultural Adviser, from time to time.
- (3) The authorised packer may, after obtaining the prior approval of the Agricultural Marketing Adviser, mark his private trade mark on a container in a manner approved by the said officer, provided that the private trade mark does not represent a quality or grade of Niger seeds different from that indicated by the grade designation mark affixed to the container in accordance with these rules.

SCHEDULE I

(See Rules 3 and 4)

Grade designation and definition of quality of Niger Seeds

Grade designation	Definition of quality					General characteristics
	Special characteristics					
	Foreign matter, percent by weight	Immature shrivelled and dead seeds, percent by wt. (max.)	Damaged, discoloured and slightly damaged seeds by wt. (max.)	Total impurities (total of Col. 2&4), percent by wt. (max.)	Moisture content, percent by wt. (max.)	
1	2	3	4	5	6	7
Special	1.0	2.0	2.5	3.0	6.0	Niger seed shall be: (1) obtained from the plant <i>Guizotia abyssinica</i> , cass, family composite, (2) free from fungus and insects attack live insects, obnoxious smell, rodent contamination and excreta, colouring matter, nonedible oil seeds and all other impurities except to the extent specified.
Good	2.0	3.0	3.5	4.0	8.0	
General	3.0	4.0	5.0	5.0	8.0	

Definitions : (1) Foreign matter: Means dust, lumps of earth, dirt, stones, stem, straw or any other impurity and/or any other edible/non-edible seeds.

(2) Immature shrivelled and dead; Are the seeds which are imperfectly developed and/or shrunken, dead seeds are those seeds which are duds and can be easily crushed by fingers.

(3) Damaged discoloured and slightly damaged: Are the seeds that are materially or internally damaged or discoloured, so as to affect the quality of the material. Slightly damaged means the seeds which are superficially damaged or discoloured not materially affecting the quality.

(Gazette of India Part II, Section 3, subsection (i), 15 January 1983; 149-150)

282 Labelling and marking requirements for food in UAE

The DUBAI municipality requires the following information to be shown on food labels.

- (1) Name of food.
- (2) Production and expiry dates on individual retail packs printed on labels or embossed on containers. Stamps, additional labels or stickers are not acceptable. (When given in numerical form dates must be in chronological order, i.e. day/month/year).
- (3) Ingredients.
- (4) Net weight or volume.
- (5) Name and address of manufacturer and country of origin.

(Cashew bulletin 20(6); 1983; 4)

283 New labelling and marking regulations in Greece

By Decree of 4th November, 1982, the Greek authorities have decided that starting from 1st January 1983, the following particulars should appear in Greek on the label of imported goods.

- (1) Trade name and full address of importers, agent or representative.
- (2) Kind of product.
- (3) Weight or volume for fluids.
- (4) Name of producing country.

Exempted from this measure are products for which special labelling regulations exist, particularly food products and pharmaceuticals. The responsibility of applying these labelling provisions lies with the importers, agent or representative.

(Cashew bulletin 20(6); 1983; 4)

284 Sets minimum Brix for canned pineapple juice

FDA has set a new minimum soluble solids level of 12.8° Brix for canned pineapple juice from concentrate.

(Food Technology 37(1); 1983; 54)

285 Codifies prior sanctions for nitrates, nitrites

FDA has codified prior sanctions for the use of nitrates and nitrites in cured meat and poultry products, on the basis of conclusions reached by USDA that use of sodium and potassium nitrate and nitrite to fix colour and serve as a preservative in cured meat and poultry products was sanctioned

by USDA under the Federal Meat Inspection Act and the Poultry Products Inspection Act prior to Sept. 6, 1958. Thus, historical uses of nitrates and nitrites in meat and poultry products need not be approved under the Federal Food, Drug and Cosmetic Act, though they are subject to the general adulteration provisions of the acts.

(*Food Technology* 37(3); 1983; 43)

HYGIENE

286 Ammonia treatment for mouldy corn

Corn contaminated with aflatoxin can be lethal to animals and there is reason to believe that it is carcinogenic. Such corn can be treated with ammonia to produce alcohol fuel. Also, the protein-rich residues which remain after treatment are safe enough for livestock feed.

Test-tube studies provided that the ammonia treatment kills aflatoxins.
(*Asean Food Handling Newsletter* No. 8; 1983; 4)

PERSONALIA

Nil

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RAW MATERIALS

287 Asparagus varieties for Kashmir Valley

Asparagus occupies an important place among canned vegetables. The climate of Kashmir is highly suitable for its cultivation. Attempts made earlier to commercialise this crop in Kashmir Valley have not been very successful. In 1978, Regional Research Laboratory at Srinagar introduced varieties which gave higher number of spears of which 38% were extra large, 24% large and 38% medium sized, while local varieties produced only medium sized spears.

The yield per hectare is 2,70,000 spears (valued at Rs. 37,000/-) after the 3rd year of its growth. The plant continues yielding spears for 15 years. The new varieties released by the Regional Research Laboratory are being grown by many growers in the Valley in about 24 hectares. The return of this crop are higher than any other cash crop.

(Spices Newsletter 17(9); 1983; 7)

288 Superior strain of spearmint

In India, *Mentha spicata* is being cultivated only to a limited extent. The plant yields spearmint oil which is used in flavouring industry mainly for flavouring chewing gums, tooth pastes and food products. Most of the requirements of the Indian flavour industry are met by imports from USA.

A new strain of spearmint was procured from USA and its performance was evaluated under Indian conditions. Preliminary studies indicated that the plant grew well under local conditions. The new strain grew taller and had broader leaves as compared to the local strain. The herb yield of the new strain was 30% more than the local one. Further, the new strain had 0.55 to 0.60% oil on fresh weight basis, as compared to the local strain which has only 0.25 to 0.32% oil. The quality of oil of the new strain was found to be similar to that of the local strain.

(Spices Newsletter 17(8); 1983; 9)

STORAGE AND INFESTATION CONTROL

289 Insect detection in grain stocks

According to international norms, export of cereals cannot take place unless these are totally exempt from insects. In order to reduce the risk run by stockists due to these insects and to facilitate sanitary inspection of massive quantities of delivered grain, scientists at the French National Institute of Agronomical Research (INRA) have perfected new systems of early detection of weevil infestations to complete methods already being used, such as the riddling of adult insects (free forms).

At the INRA centre in Bordeaux two methods are currently being developed which rapidly check juvenile insect forms embedded in the interior of the grain (hidden forms). These methods are: the measurement of respiratory carbon gas by an infrared analyzer and an amplification system of the sounds caused by the alimentary activity of the weevil larvae. Apparatus corresponding to the latter procedure, whose prototype has already been studied at the INRA centre in Jouy-en-Josas, should soon be making its appearance in the professional stocking milieu.

[Scientific News from France, September-October, 1983; 12]

290 Development of FFA in stabilized bran due to moulds and insects

Rice bran, if extracted immediately after milling yields an edible grade oil whereas storage leads to free fatty acid (FFA) increase. Stabilization of bran inactivates lipase, kills moulds and insects and arrests rice in FFA. Inoculation of *Aspergillus flavus* to stabilized parboiled bran caused FFA increase of 0.07% per day in bran with 9.5% moisture when the fungal count attained 13.2×10^4 /g in 130 days storage. In bran with 11.0% moisture the fungal count increased 34.3×10^4 over the same period with 1.0% FFA increase per day. Despite stabilization fungal contamination resulted in FFA increase above 10% level in 90 days in bran with 9.5% moisture and within 30 days at 11.0% moisture. Introduction of larva or adult of *Tribolium castaneum* (20 per 100g) after stabilization increases FFA above 10% within 30 days despite low moisture. Since FFA above 10% is considered less economical for oil refining stabilized bran also has to be protected against microbes and insects.

(Tamilnadu Agricultural University Newsletter 13(5); 1983; 1-2)

291 Seed storage studies in horsegram (*Macrotyloma uniflorum* linn)

Seeds of horsegram Co 1 dried to 7.5% moisture content and treated with Captan 75% WP @ 2 g per kg of seed can be stored in moisture proof containers like cloth bag upto 24 months. They can be safely stored upto 32 months, if packed in moisture - vapour proof container like polyethylene - 700 gauge thick bag. Cow dung treatment of seed at 1:200 ratio will also be economical and effective under the storage conditions obtainable at Coimbatore.

(Tamilnadu Agricultural University Newsletter 13(5); 1983; 3)

292 Insect monitoring systems

Insect monitoring systems - called StorGard^{YM} - use pheromones to attract pests in food storage areas so that insect infestation may be detected earlier and appropriate pest control steps can be taken. Four pheromone based systems are available to monitor several insects of major consequence to stored food products. These systems include: Plodia, which attracts Indian meal moth, almond moth, raisin moth, tobacco moth, and Mediterranean flour moth; Trogoderma species, which attracts warehouse beetle and Khapra beetle; Tribolium species, which attracts red and confused flour beetles; and Oryzaephilus species, which attracts sawtooth grain beetles and merchant beetles. Except for the Plodia system, which uses pheromones only, all of the systems employ both pheromones and food attractants. The monitoring systems are designed to allow pest managers to isolate infestations and confine treatments to only those areas affected. Use of Storgard also reduces the amount of time and labour spent in observation.

(Food Technology 37(6); 1983; 95)

293 Grain storage bin

It is a cheap storage structure. It can be constructed with locally available materials such as brick, stone slab, sand, cement and damp proof materials. The present spoilage of grain due to defective storage structure at the village level of about 6 to 7 per cent will be reduced considerably by constructing or effecting improvement to the existing storage structures. This is meant for small and marginal farmers and for farmers growing food grains up to 20-40 quintals. The cost of construction of 1 tonne (10 quintal), 1½ tonne (15 quintal), and 2 tonne (20 quintal) approximately comes

to Rs. 600, 700 and 850 respectively. Any village mason can easily construct storage structure since it does not involve complicated technology.

(UAS Diary 18(6); 1983; 4)

294 Sealing compound protects grain

A new product developed in Australia has been formulated to help eliminate insect damage to stored grain. Siloflex is a one-part, non-toxic, water-based sealing compound applied by spray or brush and is available from Silotech. The compound has been specially developed to be used in association with fumigation methods of insect control in grain storages.

A properly sealed storage is necessary for successful fumigation. The product is easily sprayed on by contractors using conventional spraying equipment. It is marketed in cans of 4, 20 and 200 litres (1 gal, 4.5 gal and 44 gal) and is ready to use direct from the container.

On horizontal surfaces, adequate thickness may be achieved in one operation but a second coat may be needed on vertical surfaces. Its flexibility permits thermal movements in joints and seams. It has high resistance to ultra-violet light and may be used in direct contact with grains and foods. Laboratory tests at the Western Australia Institute of Technology have shown that the product maintains its flexibility for at least 18 years.

Sealing and fumigation preserve profits in the form of grain saved as it is estimated that 15 per cent of world grain production is consumed by grain insects. As well as supplying the compound, the manufacturer will send a sealing expert to any part of the world to supply the technology for proper sealing and to train local operators.

(Australian Trading News August 1983; 4)

295 Anti-rodent paste

Soviet Scientists have developed a new means of protection from rodents. Dubbed algopaste, it is manufactured from algae which grow in inland bodies of water. The paste contains biologically active substances which induce disgust in the animals and scare them off. The algopaste is equally effective against house mice, moles, common fieldmice, brown rats and Colorado beetles and their larvae. It poses no hazard to man.

(The Hindu September 7, 1983; 19)

296 New process to prolong meat shelf-life

Meatox is a new process, marketed jointly by BOC and GB Food Machinery, that prolongs the shelf-life of minced meat. Normally, as soon as meat is minced, it starts to brown and after only 36 hours, its colour can become so unsightly that the meat becomes unsaleable. Even if it is packaged and put on chilled display, shelf-life is restricted to a few days. Meatox is a process that delays the colour change by mixing BOC Food Grade oxygen with the meat just before it reaches the mincing plate. The result is that meat will keep its fresh red colour for up to 48 hours, if left unpacked, and up to six days, if wrapped immediately in a modified atmosphere with an oxygen/carbon dioxide mixture.

The level of oxygen used is maintained by a control panel which automatically sets the process in motion as soon as the mincer motor starts running. When switched on, oxygen is passed into the meat through special injector nozzles fitted to the barrel of the mincer. There, it supersaturates the myoglobin in the meat and delays the change from 'oxy' to 'met' states, which is the browning mechanism. The Meatox process is used for any meat or meat product and can be fitted to any make of mincer which can be obtainable with the system fitted as standard by GB Food Machinery Co Ltd. of Olney, Bucks, U.K.

(Asean Food Handling Newsletter No. 10; 1983; 5)

FOOD ADDITIVES

297 Natural grape colour developed

A natural grape colour has been produced in Australia using equipment designed and built by Howden Equipment Services Pty Ltd., in conjunction with the CSIRO, Division of Food Research.

The colour, which has been extracted from Shiraz grapes, is burgundy red and comprises natural anthocyanins which are colour-stable at a pH below 5.5. It is currently available in liquid form and work is proceeding to produce the powdered version.

Because of possible carcinogenicity of some commonly used synthetic food colouring materials there is a trend towards the use of naturally occurring pigments. The production of this natural colour extract is therefore expected to fill a need in the food and pharmaceutical industries worldwide.

(Food Technology in New Zealand 18(2); 1983; 5)

298 Wood smoke flavours snacks

Red Arrow has developed a wood smoke flavouring of interest to the snack food and prepared mix industries. CharMaize is a lightly-flavoured corn flour for use in batter and breading mixes for meat and seafood products, and is also especially suitable for prepared and snack foods using corn. It imparts a very delicate flavour to the product. The new flavour can be used as a source of flavour in binder flours such as corn flour for meat products.

(*Food in Canada* 43(8); 1983; 44)

299 Infra-red cooking for better soybean quality

Keeping qualities and energy yields of soybeans can be increased and anti-nutrient enzymes reduced with a British-made micronising machine. The Micro-Red 20 uses infra-red heat to more than double the energy value of raw beans while at the same time reducing trypsin inhibitor and lectin factors to safe levels. Micronisation of soybeans does not impair the value of other important nutrients or amino acids and produces a 38% protein, 20% oil full-fat product, rich in lineoleic acid, which can be incorporated into high-density diets for poultry, pigs and calves without the need to add fats during mixing.

The machine has a vibratory conveyor 1.3 m wide x 15 m long which carries the bean beneath infra-red heaters which can be either gas or electric. Vibration ensures that beans are constantly moving so that all surfaces receive an equal amount of heat during the pre-set process time of up to 130 seconds. Once their internal temperature has reached 120 C the beans are transferred to an insulated holding bin where they continue to cook with their own residual heat for pre-determined periods between 10 and 30 minutes. They are discharged via a variable speed rotary valve to a cooler prior to storage of grinding. The plant is complete with feed hopper, electrical controls, cooler, insulated maturing holding bin, cooling fan, cyclone and air trunking. Output is between 1,700 kg (3,748 lb) and 2,000 kg (4,409 lb) per hour according to origin and moisture content of the beans. Size of the machine is 7.4 m long x 2 m wide x 5.5 m high (24.3' x 6.6' x 18') and weight is 7,600 kg (16,755 lb).

(*Food in Canada* 42(5); 1982; 37)

300 New system for identifying meat types

In the growing fast-food market, where minced meat is used widely, it is difficult to distinguish various meat types. But a technique using antibodies to recognize the different characteristics of meat was demonstrated at the Royal Show at Stoneleigh in the English midlands. Elisa relies on the unique interaction between highly specific antibodies and their corresponding species-specific antigens or proteins. To identify species, an extract from the meat, containing its antigens, is attached to a plastic surface. Different types of antibodies are added, but only those recognizing the antigens bind to them. The antibody antigen complexes so formed are identified by a second antibody which is linked to an enzyme. The enzyme causes a reaction to give a characteristic colour. Horsemeat only gives a coloured reaction to the presence of specific horse antibodies; similarly beef only reacts with beef antibodies. In this way processed meats can be clearly identified.

[*Food in Canada* 42(8); 1982; 23]

301 Vitamin E - an answer to the nitrosamine problem?

The most recent news in the nitrite-cured bacon controversy is that a processing procedure developed by Michigan State University scientists appears to be almost 100% effective in stopping nitrosamine formation in cooked bacon. J. Ian Gray, SMU Professor of Food Science and Agricultural Experimental Station researcher led the scientific team that identified a method of adding alpha tocopherol - vitamin E - to the salt used in curing bacon. It can be used in both dry-cure and brine-cure operations without fundamental changes in procedure. "The vitamin E acts as a nitrite scavenger," says Gray. "It reacts with nitrite, rendering it unavailable to react with secondary amines to form nitrosamines." Bacon is the only cured meat in which nitrosamine formation is a problem, Gray notes. The formation of nitrosamines appears to be heat-induced and bacon fat is an excellent heat conductor.

The MSU study, has resulted in a reliable method of reducing nitrosamines to 2 ppb (parts per billion) or less at a cost of about one cent per pound of bacon. The Hoffman-LaRoche chemical company has petitioned the Federal Food and Drug Administration to classify alpha-tocopherol as a "generally recognized safe" food additive. Scientists have studied more

than 100 nitrosamines and found almost all of them to be carcinogenic. The primary nitrosamine formed in cooked bacon is nitrosopyrrolidine. During the MSU studies a previously unidentified nitrosamine - nitrosothiazolidine was isolated with the aid of gas chromatography mass spectrometry procedures.

Gray says campus researchers can detect nitrosamine levels of 0.1 and 0.05 nanograms (compared to parts per trillion) by using a thermal energy analyzer purchased by the Agricultural Experimental Station. He added, "the levels of nitrosamines we are recording now are down to two parts per billion or less, and those are only detectable because of the sensitivity of the instrumentation." Gray says the 2 ppb measurement obtained in cooked bacon treated with alpha-tocopherol is comparable to two drops of water in an olympic-sized swimming pool. Such low levels are achieved under carefully controlled bacon processing conditions. But, Gray notes, even if double the allowable amount of nitrite happened to be mixed into a batch of bacon, the alpha-tocopherol in the salt cure would safeguard against nitrosamine formation at excessive levels.

(*Food in Canada* 43(5); 1983; 14)

302 Bottling of coconut water

Bottled coconut water which resembles natural tender coconut water in flavour can be used as a soft drink. Coconut water from mature ripe coconut is upgraded to the level of tender coconut water preserved and bottled so as to facilitate storage and transport.

Economic prospects - About 270 million litres of coconut water is stated to be available from copra processing units in Kerala State alone which is being wasted at present. It is felt that a good demand of bottled coconut water can be created in the country as well as for export by adequate marketing and sales promotion. It has a good export potential particularly in Middle East countries.

Process - Coconut water obtained after breaking of the ripe coconuts has to be brought to the processing plant immediately. The coconut water is subjected to a heat treatment under controlled conditions and addition of preservatives followed by filtration. The filtered liquid is filled in standard 200 ml bottles and sealed. The sealed bottles are kept cool. It is recommended that the coconut water bottling plant should be near to the primary processing centres, i.e. copra making, or desiccated coconut industry

or partially defatted coconut industry so that the coconut water is readily available.

Main raw materials - Coconut water, sugar, chemicals and crown corks.

Main equipments - Pasteurizer; centrifuge; S.S. centrifugal pump storage vessels; vacuumatic/volumetric liquid filling machine; crown corking machine; cooling tank; label gumming machine, washing facilities; soda water machine; boiler and accessories.

Predesign cost estimates (Basis 5000 bottles of 200 ml/day)

Land and building	Rs. 1.86 lakhs
Plant and machinery	Rs. 6.93 lakhs
Working capital	Rs. 1.62 lakhs
Cost of production	Rs. 1.05/bottle

Status - Bench scale studies were conducted with batches of 10 litres of material, bottling 500 bottles/day. The product conforms to F.P.O. specifications for soft drink as far as preservative level and microbial safety are concerned. It was evaluated by more than 100 persons and was found to be acceptable. (RRL, Trivandrum)

(*Technology Awareness Service* 9(1); 1983; 3-4)

303 Ultrafiltration membranes

They may be used to clarify citrus, apple, and vegetable juices. The hollow fiber ultrafiltration membranes are manufactured from a wide variety of noncellulosic inert polymers. For juice clarification, the fibers have an inside diameter of 45 mil (0.110 cm) and a nominal molecular weight cutoff of 50,000 or 100,000. The process stream flows under pressure through the inside or lumen of the fibers. Separation occurs at the liquid/membrane interface. Higher molecular weight solutes and particulate matter are rejected by the membranes, while lower molecular weight solutes and solvent pass through the membrane skin under the driving force of pressure and are collected in the cartridge shell. The ultrafiltration membrane selectively hold back essentially all polysaccharide materials such as pectins and starch which are responsible for cloud and sediment formation.

(*Food Technology* 37(9); 1983; 72)

BYPRODUCTS AND WASTE UTILIZATION

304 Rice hulls for poultry litter

Lack of absorbency of whole rice hulls has limited their use as poultry litter, but a blend of whole and finely ground hulls has now been introduced in America by Sta-Dri. Retaining all the traditional qualities of safety, ease of maintenance and seasonal availability associated with whole rice hulls, the Sta-Dri blend is said to give the added quality of absorbency.

The new litter, with a moisture content of 7%, does not moulder easily nor readily support or carry bacteria. An added quality is that the blend keeps the litter surface dry with water passing through the top layer to be absorbed into the ground hulls. This is claimed to reduce caking spots and trouble areas near feeders and waterers. A further advantage claimed is that less volume of the blend is needed than with other litters.

(Asean Food Handling Newsletter No. 10; 1983; 5)

305 Mushroom out of cotton

The Cotton Technological Research Laboratory of the Indian Council of Agricultural Research (ICAR), Bombay, has succeeded in growing an edible mushroom out of cotton stalk and cotton willow-dust, both of which are available in plenty in the country and are now just thrown away. Under the atmospheric conditions of Bombay and where both cotton stalks and cotton willow-dust a waste product from the textile mills, are available in plenty, about 500 grams of fleshy fruiting bodies of the mushroom, locally known as dhingra (*Pleurotus major - caju*) can be obtained from one kilogram of either of the two waste products during winter months. The yield may vary from 250 to 400 grams per kilogram of waste during other months.

In laboratory trials, the cotton stalks were used by chopping them to a size of three or four centimetres and soaking the pieces in tap water overnight, willow-dust was used after treating it with four per cent lime. In both cases, the materials were packed after sprinkling of the grain-spawn in different layers in polyethylene bags of convenient sizes with two holes at the bottom. The bags were tied and incubated at room temperature (25 to 30 degrees celsius) for the proliferation of fungal mycelium. When the pin-heads started appearing after about 15 to 20 days; the bags were

slowly removed. The materials were tied with strings and hung at a well-ventilated place where the temperature did not exceed 30 deg. centigrade. Water was sprinkled two or three times a day.

(*Science of Villages* No. 70; 1983; 2)

PROCESSED PRODUCTS

306 Gluten free cake and bread mixes

An Israeli company, Bar-Kat, has developed gluten free cake and bread mixes. The cake mix is produced with a potato flour base, and contains all the ingredients necessary to produce a vanilla flavoured cake. This is prepared simply by adding water and then baking. The flavour can be varied by adding cocoa and other ingredients.

The bread mix is manufactured with a potato flour and cornflour base. It makes high quality, non-crumbling bread. This mix is available in two varieties - one for a rye bread and the other for what resembles an ordinary white.

(*Baking Today* 3(10); 1983; 4)

EQUIPMENT AND MACHINERY

307 American automatic steam peeler

The Food Processing Machinery Division of FMC Corporation in California offers an automatic steam peeler to remove skins from fruits, vegetables, fish, etc. The Peeler loads the product into a rotating pressure vessel. It introduces high pressure steam and then quickly exhausts the steam to loosen the skin. The skin could then be removed easily. The product is discharged into an auger conveyor. It is claimed by the Corporation that up to 27 tons can be processed per hour.

(*Asia-Pacific Technology Digest* 4(1); 1983; 8)

308 Planetary mixer

For dry and wet mixing of powders on an industrial scale Advani-Oerlikon's Machinery Manufacturing Division has now developed a sophisticated Planetary Mixer branded as 150 H. This has potential applications in chemical and pharmaceutical industries so also in foundries and electrode manufacturing plants.

The unique feature of this mixer is that by virtue of the direct coupling of its hydraulic drive with the hollow shaft worm reduction gear box, it can achieve three varied speeds like 50, 160 and 210 RPM. The speed can be remotely regulated even when the mixer is in operation. Another striking feature is that the mixing load, which is proportional to the hydraulic pressure, is indicated on the gauge provided.

(*Economic Times*, December 10, 1983, 13)

309 Blender

Fabdecon V Blender is an outgrowth of the simple cylinder formed by two opposed sections. It reportedly creates additional mixing action at the centre and produces uniform solid-solid and solid-liquid blends with virtually no attrition to sensitive particles. As the material is rotated close to the axis, power requirement is reduced. The blender can be used for blending fragile cereals and snack foods as well as abrasive metals, ceramics, cosmetics, pharmaceuticals, insecticides, plastics, etc. Other operations include gentle blending, liquid dispersion in solids, solid-solid coating, liquid-solid coating and agglomeration of solids. The blender comes in capacities ranging from 10 to 2,000 litres, and is constructed in carbon steel, stainless steel of all grades, alloy steel, Hastelloy, etc.

(*Industrial Products Finder* Vol.11; 1982; 467)

310 Snack food extruder

The X-200S of Wenger is designed specifically for the production of low-density (2.3-2.5 lb/cu-ft) extruded snacks such as collets and balls at production rates to 3,000 lb/hr. The X-200S can replace many smaller extruder, improving quality control and product uniformity. It reportedly reduces operating and maintenance manpower requirements and requires less production floor space. The X-200S also has a high capacity/energy requirement ratio.

(*Food Technology* 37(9); 1983; 71)

311 Grinder for grains

Rapid and uniform grinding of grains and other similar products may be accomplished with the CyclotecTM Sample Mill. The Cyclotec grinds samples by means of a high speed action which rolls the sample against the inner

circumference of a durable grinding surface and then passes the sample through a fine mesh screen. The high volume air flow provides self cleaning action and minimum temperature rise. The mill also features a low noise level (75 dBA) and improved operator safety features.

(*Food Technology* 37(6); 1983; 84)

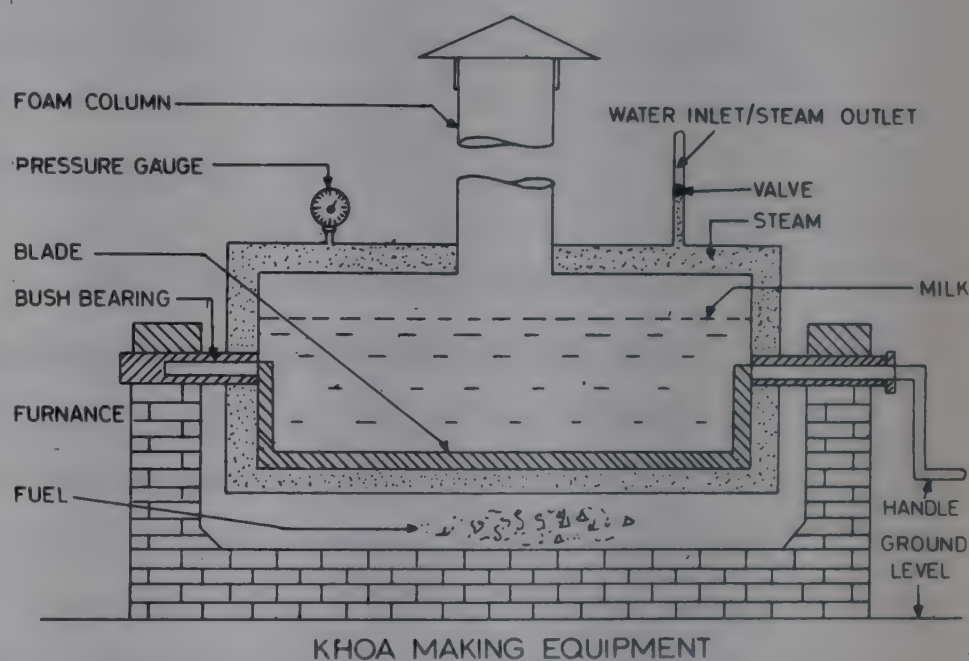
312 High volume coffee dispenser

Designated the Model FDD5000, the dispenser features adjustable brew strength and individual selector buttons for volume of dispense, so that a half pot, pot, or 1 to 10 gal amounts can be drawn from the dispenser at the touch of a button. It can brew 10 gal. of coffee in 4 minutes.

(*Food Technology* 37(9); 1983; 75)

313 Khoa making equipment for rural areas

A new equipment has been developed for manufacturing khoa in rural areas. The capacity of the equipment is 20 litres of milk per batch. It consists of a stationary, jacketed drum with inside rotating blade and a foam column at the top of the drum to accumulate the raised foam during boiling process. The blade is in contact with the inside surface of the drum and is rotated manually. The material used for the equipment is mild steel.



KHOA MAKING EQUIPMENT

The equipment is very simple in construction and does not need any specialised knowledge for its operation and construction. In general, good quality khoa is produced by the equipment due to uniform scraping and proper control over heating temperature. The total time required per kilogram of milk handled for khoa making about 7.5 minutes. The overall evaporation rate is 112.69 g of water per minute. Khoa prepared this way has good texture and colour.

(*Science Reporter* 20(4); 1983; 243-244)

314 Conveyor belting for food

A selection of PVC conveyor belts particularly suited to the food industry is included in a range of belting now available in New Zealand. The new belting, of solid woven PVC construction, is said to better the performance standards of traditional belts and cost less. Manufactured by the Georgia Duck and Cordage Mill of Atlanta, Georgia, "Georgia Duck" belting is distributed in New Zealand by Paykel Bros.

Stain resistant and easily cleaned, the belts' solid woven construction ensures extremely high rip and tear resistance. The back covers are designed to give a low coefficient of friction for use with rollers and slider trays. A full range of food grade cleats is available including T-cleats, scoop cleats, tracking guides and "Polywave" edge cleats for containing food on belting. Stainless steel "Flexco" or "Clipper" fasteners can be used for endlessing. Paykel Bros. will assist with fastening on site, or will hot vulcanise on site with its new "Vulcaweld", transportable endlessing equipment.

(Food Technology in New Zealand 36(9); 1982; 28)

315 Centrifuges/hydroextractors

Pragati centrifuges are of robust construction and are for extraction of water/liquids in chemical, pharmaceutical, textile, oil and sugar industries. The machine has central rotating basket made for MS/SS or MS lined with any corrosion resisting material such as rubber (natural rubber or butyl rubber). The basket has ample number of holes for speedy extraction of motherliquor and is dynamically balanced. The outer shell is fabricated from MS/SS or MS lined with anti-corrosion material such as natural or butyl rubber, and is suspended on robustly built CI pendulum with suspension spring and special bearings. CI bearing housing supports the special alloy steel shaft. The steel shaft is made specially for resisting stresses, caused by centrifugal forces resulting from any uneven distribution of the charges in the basket. The main base is fabricated out of mild steel with heavy bottom plate. The weight helps the machine to gain rigidity and strength to resist vibration. Models are available in various capacities.

(PFNDAI Newsletter No. 36; 1983; 1)

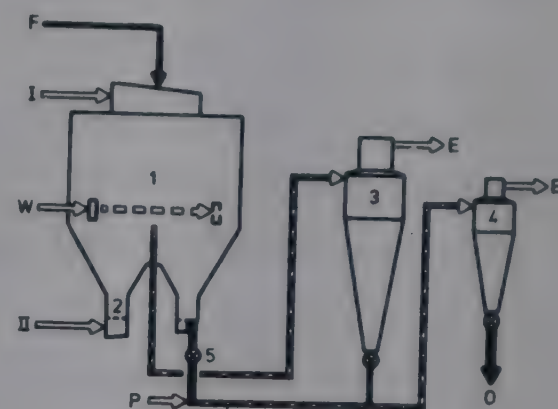
316 New types of spray drier

NiroAtomizer has introduced two new types of industrial-size spray dryers - the Multi-Stage Dryer and the Compact Dryer. Both feature a stationary fluid bed as an integrated part of the spray drying chamber. This design concept is a further development of the two-stage approach, whereby an even larger proportion of the dryer's evaporative duty is transferred from the first spray drying stage to the second fluid bed drying stage. This gives numerous advantages.

Drying chambers with integrated fluid beds require much less building height, and the floor area is also reduced. The product temperature within the dryer is lower, enabling the drying process to have a much improved heat economy. The new design concept is said to be ideal for thermoplastic and hygroscopic products. In fact, products that are difficult to spray dry in conventional spray dryers can be handled in the new designs.

The Multi-Stage Dryer features nozzle atomisation and produces agglomerated dust-free products. The Compact Dryer comes in two versions and can operate with a pneumatic transport system to produce standard powders or with a vibrating fluid bed mounted directly on the dryer to produce an agglomerated product form.

(*Food Technology in New Zealand* 18(4); 1983; 46)



I, II Drying air for first and second stage
W Wall-sweep air
P Transport and cooling air
E Exhaust air
F Feed
O Product outlet

1 Drying chamber
2 Stationary fluid bed
3 Main cyclone
4 Transport cyclone
5 Rotary valve

Flowsheet of compact dryer with pneumatic transport system.

317 Small drier for cocoa beans

A tray type, through-flow drier was designed and developed for drying upto 40 kg of fermented cocoa beans. The drier can be operated on electricity (single phase), biogas burner or kerosene wick stove. During the rainy season 40 kg fermented beans were dried from an initial moisture content of 115% (db) to 8% (db) in 60 hours. The drier gave a heat utilisation efficiency of 53% when operated on electricity. The cost of the drier worked out to Rs.1000/- and drying cost Re 0.50 per kg of dry beans.

(*Journal of Plantation Crops* 10(2); 1982; 109-13)

318 Drier cuts costs as much as 50%

Werner & Pfleiderer reports that its energy-efficient DRT spiral dryer cuts the costs of drying temperature-sensitive materials by as much as 50%. Energy savings alone pay back the investment in two to three years, says the company. The suspension-type thin film contact dryer uses air or inert gas for conveyance only; heat is supplied by conduction. The volume of heated air or gas exhausted is substantially reduced, resulting in energy consumption as low as 1,200 BTU per pound of water evaporated, depending on the feed material. Designed for processing materials from fine powders to 3 mm particles, the DRT has been successfully used for foods and other materials that require gentle drying. The DRT consists of two concentric cylinders: a jacketed outer body and a slowly-rotating hollow inner body on which staggered spiral vanes are welded. A heating medium is circulated through the jacket and inner body. Free-flowing feed material enters the annular space between the two cylinders and is spread into a thin film against the inside wall of the heating jacket.

(*Food in Canada* 43(2); 1983; 28)

319 Unique cooker - extruder

The unique extrusion cooking plant to produce flat breads is the only such fully automatic line in the world. This continuous mixing, cooking, extruding plant produces 500 kilos of flat bread per hour on two shifts. It was built by Stuttgart's Werner & Pfleiderer, under the label Continua 120, in cooperation with Jaus' production manager Robert Wagner. In full operation, four flat-bread strips are extruded at one time from the Continua mixing and extruding cooker through adjustable dies and fed to the gauging and cutting device. After passing through a drying and roasting oven (to improve taste), the sliced bread runs through a cooling section, to a sorting and stacking section, and finally through a turning unit to the packing machines on a cooled conveyor.

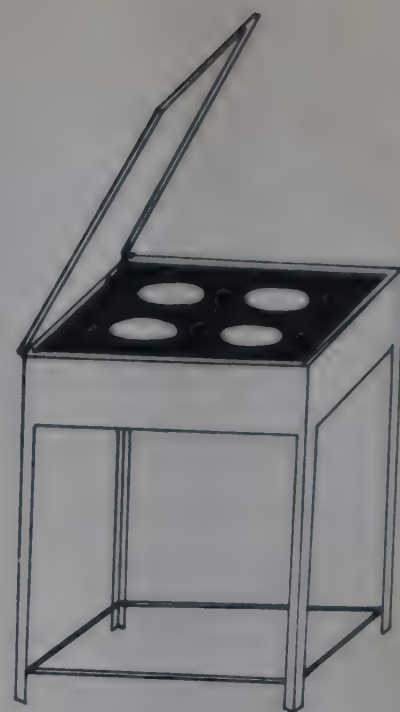
(*Food Engineering International* 8(5); 1983; 41)

320 Box type solar cooker

The Agro-Energy Department of the Tamilnadu Agriculture University has designed and developed a box type solar cooker. The box can hold four aluminium vessels, all of which can be used at a time for cooking. The designers

claim that two kg of rice and dal can be cooked within 90 minutes. The cooker has a simple flat type collector system. It is made up of an inner M.S. metal box of 20 gauge thickness and outer wooden box with a top wooden cover having two plain glass windows three mm thick. The space in between the inner and outer box is filled with 10 cm thick glass wool to insulate the cooling chamber. The top cover can be opened and closed since it is fitted to the box with hinges and pad lock fixtures. Aluminium anodised polyester paper acts as a reflector and also as a top cover. The reflector would be faced towards the sun for cooking food materials.

(Financial Express November 16, 1983; 3)



321 Indian solar basket

Now you can make 'Solar Basket'. It costs Rs. 60-100 depending on the size of the basket which starts at 1.4 m diameter. The basket is made of bamboo and smoothened over inside with special papier mache (2 kg wheat flour, 1 kg methi powder, 5 kg paper pulp) and the basket is formed over a precise paraboloid mould made from cement concrete or plaster of Paris. The smooth inner surface of the basket is lined with silver foil which is glued to the surface acting as reflecting parabolic mirror. The focal point of about 20 cms rests in the centre. A tripod of bamboo poles is used to suspend the cooking vessel with a rope. The basket is adjusted according to the position of the sun. It is claimed that it takes 3 minutes to boil 1 litre of water, 15 minutes to cook rice and 30 minutes to cook dal or chicken curry. It works from 8 a.m. to 4 p.m. on sunny days.

(Asia-Pacific Technology Digest 4(1); 1983; 10)

322 Nepalese cooking stoves

The Agricultural Development Bank, in association with the UNICEF, has developed a fuel efficient family cooking stove. It is claimed to reduce 30% of fuel costs. To make the stove the following items are needed: stove set, chimney pipes, wall hooks, thin wire for pipe fixing, small damper, sheet metal, hacksaw blade, bricks and clay. The Agricultural Development

Bank will help in setting up the cooking stove.

(*Asia-Pacific Technology Digest* 4(10);1983; 10)

323 Vacuum oven

A vacuum oven suitable for dehydration, drying, conditioning and evaporating in chemical and food processing industries and economic component testing has been developed in India. and available with Toshiniwal Instruments, Madras. This oven can also be used in drying thermosensitive substances and for accelerated dehydration; laboratory tests on vacuum impregnation and heating substances under controlled atmosphere or gas media.

(*Documentation Bulletin* No.52; 1983; 15)

PACKAGING

Nil

ANALYSIS

324 Microwaves to measure moisture

The CEM Corporation Automatic Volatility Computer AVC Model MP, combines the latest developments in microwave drying and digital computer technology to provide rapid and accurate moisture/solids determinations, the makers say. It is completely automatic. It is applicable to all types of materials including solids, liquids, slurries, from 01 to 100 per cent moisture. Complete determination requires only minutes.

The AVC-MP consists of an electronic balance, a microwave drying system and a microprocessor. The system is simple to operate, Place a sample on the balance pan, close the oven door and depress the appropriate pushbutton. From this point on, the instrument operates unattended, displaying the moisture/solids result in a matter of minutes.

The initial sample weight is stored and the microwave oven is actuated for a period of time to dry the sample. At the end of the drying interval, the oven is turned off, and the final weight, weight loss and per cent moisture/solids are displayed on a digital panel readout. The advantages of microwave drying are speed and selectivity.

(*Food Technology in New Zealand* 36(9); 1982; 28-29)

325 Photometer for viable cell assay

Viable cell assays in minutes may be accomplished using a photometer system of Turner Designs. The photometer may be used to monitor fermentation processes for alcoholic beverages and dairy products; to check for microbial contamination in foods, syrups, and fluids; and to measure the amount of live biomass in activated sludge. The photometer measures luminescence to quantitate the amount of living matter in any sample. A brochure available with Turner Designs, 2247, Old Middlefield Way, Mountain View, CA 94043, discusses the operation of the photometer, its applications, advantages, features, and computer interfacing capabilities.

(*Food Technology* 37(9); 1983; 64)

326 Microbial growth analyser

Microbiological growth analyzer can measure levels of bacteria growth in food in 3 hr. The analyzer measures bacterial growth in the culture by monitoring the change in the electrical conductance of the growth medium. Conductance of the cultures, in 112 or 128 sample cells, is repeatedly monitored in sequence. Scan times are programmed from 4 min. to 30 min. Data is collected, stored, and processed by the system's built-in computer. Software is available for many common microbiological applications, including antibiotic sensitivity, minimum inhibitory concentration, and threshold levels. Results can be monitored on a chart recorder or shown in graphic or tabulated form on a visual display. The analyzer is manufactured by Malthus Instruments Ltd., Stokeon-Trent, England.

(*Food Technology* 37(9); 1983; 66)

327 Microbial contamination analyser

Microbial contamination in foods, syrups, and fluids may be measured in minutes using the Model 20 Luminometer which is available from Turner Designs. The Model 20 measures luminescence which is proportional to the amount of ATP and the number of viable cells present in the sample. Sanitation of processing areas may be routinely checked with the microprocessor-controlled instrument.

(*Food Technology* 37(6); 1983; 90)

328 Water activity measurement system

Water activity measurement system model EEJA simultaneously measures water activity value and test temperature of up to three samples. The Model EEJA includes a thermo-electrically powered constant temperature chamber which quickly achieves and stabilizes within ± 0.1 C at any selected temperature in the span of 5^o-50^o C. All values are sequentially displayed on the module's liquid crystal display readout and are permanently logged on a self-contained recording unit.

(*Food Technology* 37(10); 1983; 105)



329 New HPLC column technology for protein analysis.

Applications Report on New Column Technology presents information on four HPLC columns which reportedly make it easy to perform a thorough analysis of many types of proteins, using only HPLC methods. The whole picture of the protein mixture may be achieved by resolving it into as many as four complementary patterns using four different separation mechanisms including ion exchange, gel filtration, reverse phase, and hydroxylapatite fractionation on the same HPLC system. Each mechanism allows the operator to identify and quantitate different peaks, peaks that may not be apparent by any one mechanism used alone. The system allows for multi-step purification of a single protein from a complex protein mixture.

(*Food Technology* 37(9); 1983; 68)



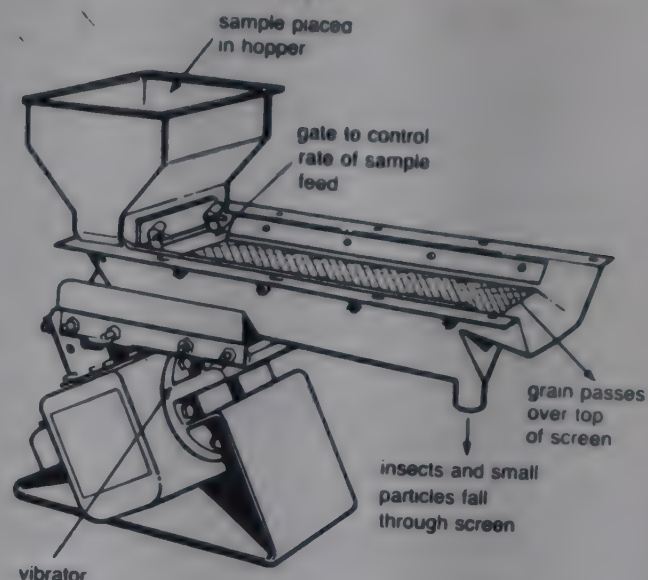
330 Vibratory screen for insect detection

Australian wheat exports are sold on the basis that they are relatively insect-free, and now a simple vibrating screen developed by the CSIRO Wheat Research Unit will make the detection of adult, freemoving grain insects a little easier. The apparatus uses expanded metal 'Ornamesh' as the screening material; this allows the grain to flow over the top while small particles and insects pass through and are collected in a tray. It may be used to treat batches of grain of about 500 g weight, or it may be set up to

treat a flowing sample drawn continuously from a belt conveyor. In either case, detection of the insects is readily carried out by examining the fine material screened out of the grain.

The screen should greatly expedite the examination of export grain for insect infestation, since it is rapid, simple, and reliable. It is important to appreciate, however, that it will detect only freely moving adult insects, but not eggs or larvae trapped within the grains. Detection of these forms requires complex and sophisticated equipment, which measures the amount of respiratory carbon dioxide they produce.

(Asean Food Handling Newsletter No. 10; 1983; 5)



331 Can tester

Vibrotone is a non-destructive-on-line, all-electronic equipment for measuring the vacuum of sealed cans developed by Central Electronic Engineering Research Institute, Pilani. The equipment has a distinct advantage over the piercing-type vacuum gauge (destructive methods) presently used by the food-preservation and canning industry. Small-scale canning units would greatly benefit by exploiting this invention to increase productivity as well as to maintain a uniform quality of products.

For a unit to produce 25 vibrotones per annum a fixed capital (for equipment only) of Rs.50,000 and a working capital of Rs.1,25,000 will be required, the estimated cost of production being Rs. 18,000.

(Processed Foods Export Promotion Council 6(7); 1983; 27)

COMMERCIAL INTELLIGENCE

PRODUCTION (RAW MATERIAL)

332 All India final estimate of groundnut, 1982-83

State/Crop	Area (Thousand hectares)	Production (Thousand Tonnes)
1	2	3
Andhra Pradesh	1,491.4	1,099.6
Bihar	6.8	4.4
Gujarat	2,057.7	1,312.9
Haryana	7.1	5.0
Himachal Pradesh	1.4	0.1
Jammu & Kashmir	Negg	Neg.
Karnataka	854.6	560.4
Kerala	9.4	8.3
Madhya Pradesh	296.9	152.5
Maharashtra	767.5	725.2
Nagaland	0.2	0.1
Orissa	252.9	359.2
Punjab	78.0	63.0
Rajasthan	182.2	103.1
Tamilnadu	1,028.5	967.1
Tripura	1.2	0.9
Uttar Pradesh	305.3	187.2
West Bengal	1.6	1.6
Pondicherry	2.5	2.1
ALL INDIA	7,345.2	5,552.7

Groundnut is not grown to any appreciable extent in States/
Union Territories not mentioned above.

(Directorate of Economics and Statistics, Ministry of Agriculture,
Government of India)

333 All India final estimate of nigerseed, 1982-83

State	Area (Thousand hectares)	Production (Thousand Tonnes)
1	2	3
Andhra Pradesh	7.7	1.9
Bihar	32.9	12.6
Karnataka	47.7	8.3
Madhya Pradesh	226.1	39.6
Orissa	98.0	40.5
Maharashtra	86.7	14.2
West Bengal*	1.5	0.9
Dadra & Hagar Haveli	0.2	0.1
ALL INDIA	500.8	118.1

* 1981-82 data reported in the absence of information for 1982-83.

Nigerseed crop is not grown to any appreciable extent in other States and Union Territories not mentioned above.

(Directorate of Economics and Statistics, Ministry of Agriculture, Government of India)

334 All India final estimate of rapeseed & mustard, 1982-83

State/ Union Territory	Area (Thousand hectares)	Production (Thousand Tonnes)
1	2	3
Andhra Pradesh	0.7	0.2
Assam	224.0	102.7
Bihar	74.9	46.4
Gujarat	171.4	211.2
Haryana	202.0	141.0
Himachal Pradesh	6.5	2.2
Jammu & Kashmir	43.1	64.0
Karnataka	2.5	0.5
Madhya Pradesh	259.6	128.9
Maharashtra	5.3	1.7
Manipur	3.0	1.5
Meghalaya	6.1	3.2
Nagaland	2.6	1.1
Orissa	123.7	60.3
Punjab	85.9	64.0

Contd.

contd.

	1	2	3
Rajasthan		605.9	442.7
Sikkim		8.3	3.2
Tamil Nadu		1.4	0.4
Tripura		3.0	2.0
Uttar Pradesh (P)		2187.5	1097.8
West Bengal		170.9	91.0
Arunachal Pradesh*		8.7	6.1
Delhi		1.0	0.2
ALL INDIA		4194.2	2472.3

(P) - Provisional

* - Relate to 1981-82.

Rapeseed and mustard is not grown to any appreciable extent in the States and Union Territories not mentioned above.

(Directorate of Economics and Statistics, Ministry of Agriculture, Government of India)

335 All India final estimate of sesamum (til or gingelly), 1982-83

State	Area (Thousand Hectares)	Production (Thousand Tonnes)
1	2	3
Andhra Pradesh	161.6	21.9
Assam@	12.6	6.1
Bihar	17.5	6.2
Gujarat	128.0	31.6
Haryana	2.7	1.1
Himachal Pradesh	3.4	0.6
Jammu & Kashmir	6.4	1.2
Karnataka	104.3	25.0
Kerala	14.3	3.6
Madhya Pradesh	243.3	27.6
Maharashtra	198.5	46.6
Manipur	1.1	0.5@
Meghalaya	0.7	0.4
Nagaland	0.8	0.4
Orissa	236.9	123.3
Punjab	14.3	5.2
Rajasthan	461.1	41.1
Tamil Nadu	132.6	32.4

Contd.

Contd.

1	2	3
Tripura	2.6	0.9
Mizoram*	1.8	0.6
Arunachal Pradesh@	0.1	0.1
Uttar Pradesh (Pure)	50.4	3.4
Mixed	862.2	57.8
Total	912.6	61.2
West Bengal\$	122.6	64.4
Pondicherry	0.3	0.2
ALL INDIA	2780.1	502.2

@ - Relate to 1981-82

\$ - Includes 1981-82 data in respect of the summer crop of sesamum.

* = Relate to 1980-81

NOTE: Sesamum is not grown to any appreciable extent in States/Union Territories not mentioned above.

(Directorate of Economics and Statistics, Ministry of Agriculture, Government of India)

336 All India final estimate of safflower, 1982-83

State	Area (Thousand hectares)	Production (Thousand tonnes)
Andhra Pradesh	38.6	12.6
Bihar*	0.5	0.2
Karnataka	163.5	79.0
Madhya Pradesh	1.2	0.2
Maharashtra	547.2	277.6
Orissa	4.1	1.9
ALL INDIA	755.1	371.5

* - Relate to 1981-82.

Safflower is not grown to any appreciable extent in States and Union Territories not mentioned above.

(Directorate of Economics and Statistics, Ministry of Agriculture, Government of India)

337 All India final estimate of sunflower 1982-83

State	Area (Thousand hectares)	Production (Thousand tonnes)
Andhra Pradesh	8.3	4.0
Bihar	0.6	0.2
Karnataka	150.5	63.7
Maharashtra	193.5	115.0
Orissa*	0.9	0.5
Rajasthan*	0.6	0.4
Tamil Nadu	68.1	35.6
Uttar Pradesh**	6.3	4.4
West Bengal*	1.9	0.9
ALL INDIA	430.7	224.7

* - Relate to 1981-82.

** - Relate to 1980-81

Sunflower is not grown to any appreciable extent in States/Union Territories not mentioned above.

(Directorate of Economics and Statistics, Ministry of Agriculture, Government of India)

338 All India final estimate of soyabean, 1982-83

State	Area (Thousand hectares)	Production (Thousand tonnes)
Gujarat*	11.0	4.5
Himachal Pradesh	0.4	Neg.
Madhya Pradesh	584.1	386.6
Meghalaya	0.7	0.6
Nagaland**	0.4	0.2
Rajasthan**	9.8	6.5
Sikkim	3.1	2.5
Uttar Pradesh	157.2	117.4
West Bengal	0.6	0.2
Arunachal Pradesh	0.6	0.4
ALL INDIA	767.9	490.9

Contd.

Fully revised estimates for Madhya Pradesh, Meghalaya, West Bengal, Nagaland and Arunachal Pradesh and final/revised estimates for others.

Neg. - Negligible

* - Data relate to 1980-81

** - Data relate to 1981-82

States/Union territories not mentioned above do not grow soyabean crop to any appreciable extent.

(Directorate of Economics and Statistics, Ministry of Agriculture, Government of India)

339 All India final estimate of coriander, 1982-83

State	Area (Thousand hectares)	Production (Thousand tonnes)
Andhra Pradesh	118.7	35.9
Bihar*	5.8	4.5
Haryana	0.4	0.2
Karnataka	13.8	1.7
Madhya Pradesh	38.8	13.0
Orissa	11.2	5.5
Rajasthan	108.6	72.3
Tamil Nadu	46.3	18.2
Uttar Pradesh@	5.6	2.9
ALL INDIA	349.2	154.2

Fully revised estimates for Andhra Pradesh and Madhya Pradesh, revised estimates for Karnataka, Orissa, Rajasthan and Tamil Nadu and final estimates for others.

@ - 1980-81 data repeated in the absence of data for subsequent years.

* - 1981-82 data repeated in the absence of data for 1982-83.

Coriander is not grown to any appreciable extent in States and Union Territories not mentioned above.

(Directorate of Economics and Statistics, Ministry of Agriculture, Government of India)

340 All India final estimate of black pepper, 1982-83

State	Area (Thousand hectares)	Production (Thousand tonnes)
Karnataka	2.43	0.62
Kerala	107.74	27.78
Tamil Nadu	0.67	0.11
Pondicherry	0.01	0.01
ALL INDIA	110.85	28.52

Black pepper is not grown to any appreciable extent in other States/
Union Territories not mentioned above.

(Directorate of Economics and Statistics, Ministry of Agriculture, Govern-
ment of India)

341 All India final estimate of cardamom, 1982-83

State	Area (Thousand hectares)	Production (Dried cured cardamom) (Thousand tonnes)
Karnataka	30.2	1.8
Kerala	54.0	3.1
Sikkim	14.5	3.5
Tamil Nadu	4.6	0.4
All India	103.3	8.8

Revised estimates for Karnataka, Kerala and Tamil Nadu and
ad-hoc estimates for Sikkim.

Sikkim has been included in this estimate for the first time.

(Directorate of Economics and Statistics, Ministry of Agriculture,
Government of India)

342 All India final estimate of garlic, 1982-83

State	Area (Thousand hectares)	Production in terms of cured dry bulbs (Thousand tonnes)
Andhra Pradesh	1.0	1.9
Bihar	2.4	2.4
Gujarat	22.4	105.5(E)
Haryana	0.4	7.4
Jammu & Kashmir*	0.1	Neg.
Karnataka	2.5	2.3
Madhya Pradesh	10.1	35.1
Maharashtra	5.0	35.7
Nagaland	0.2	0.1
Orissa	11.3	32.4
Punjab*	0.2	1.1
Rajasthan*	2.4	8.2
Tamil Nadu	0.4	2.3
Uttar Pradesh	3.4	11.2
ALL INDIA	61.8	245.6

E - Estimated. * - Relate to 1981-82. Neg.- Negligible

Garlic is not grown to any appreciable extent in States/Union Territories not mentioned above.

(Directorate of Economics and Statistics, Ministry of Agriculture, Government of India, New Delhi)

343 All India final estimate of potato, 1981-82

State	Area (Thousand hectares)	Production (Thousand tonnes)
Andhra Pradesh	0.3	0.7
Assam	40.8	282.9
Bihar	131.0	1200.0
Gujarat	10.9	243.7
Haryana	12.1	189.1
Himachal Pradesh	13.9	58.9
Jammu & Kashmir	1.4	2.8
Karnataka	11.1	86.2
Madhya Pradesh	25.4	288.9
Maharashtra	12.3	72.0
contd.		

Contd.

State	Area (Thousand hectares)	Production (Thousand tonnes)
Manipur	2.0	10.6
Meghalaya	17.2	125.2
Nagaland	5.0	28.8
Orissa	9.5	66.4
Punjab	34.7	654.3
Rajasthan	2.6	3.7
Tamilnadu	12.9	138.3
Tripura	2.4	33.2
Uttar Pradesh	303.1	4589.9
West Bengal	120.3	1984.5
Arunachal Pradesh	1.5	10.6
Delhi	0.3	1.5
Mizoram*	0.6	2.8
ALL INDIA	771.3	10075.0

* - Data relate to 1980-81

Potato is not grown to any appreciable extent in other States/Territories not mentioned above.

No information regarding crop estimates is yet available from the Govt. of Sikkim.

(Agricultural Situation in India, 37(12); 1983; 795-796)

344 All India final estimate of tapioca, 1982-83

State	Area (Thousand hectares)	Production (Thousand tonnes)
Andhra Pradesh	12.3	116.3
Assam	1.9	8.2
Karnataka	1.5	14.9
Kerala	245.6	3486.7
Meghalaya	3.9	20.2
Nagaland	0.4	1.7
Rajasthan*	0.2	0.3
Tamil Nadu	51.5	1442.8
Tripura*	0.3	1.3
Andaman & Nicobar Islands*	0.2	1.6
Arunachal Pradesh*	3.4	8.5
Mizoram**	0.3	1.0
Pondicherry	0.5	6.7
ALL INDIA	322.0	5110.2

Contd.

Contd.

* - Relate to 1981-82.

** - Relate to 1980-81

Tapioca is not grown to any appreciable extent in States and Union Territories not mentioned above.

(Directorate of Economics and Statistics, Ministry of Agriculture, Government of India, New Delhi)

345 All India final estimate of dry ginger, 1982-83

State	Area (Thousand hectares)	Production (Thousand tonnes)
Andhra Pradesh	2.00	3.50
Bihar**	0.69	1.08
Gujarat	0.34	0.26(E)
Haryana	0.02	0.02
Himachal Pradesh	1.90	0.48
Karnataka	2.38	3.10
Kerala	12.36	30.48
Madhya Pradesh	1.69	2.02
Maharashtra	0.60	0.54
Manipur	1.22	0.53
Meghalaya	5.82	24.05
Nagaland*	0.99	0.54
Orissa	5.44	5.41
Rajasthan	0.24	0.22
Sikkim	3.04	5.88
Tamil Nadu	0.38	0.32
Tripura*	0.56	0.79
Uttar Pradesh*	0.53	3.95
West Bengal	3.15	4.97
Arunachal Pradesh*	0.50	1.06
Mizoram**	0.87	1.63
ALL INDIA	44.72	90.83

* - Relate to 1981-82

** - Relate to 1980-81

(E)- Estimated

1. Sikkim has been included in this Estimate for the first time this year.

2. Ginger is not grown to any appreciable extent in States and Union Territories not mentioned above.

(Directorate of Economics and Statistics, Ministry of Agriculture, Government of India, New Delhi).

346 All India final estimate of dry chillies, 1982-83

State	Area (Thousand hectares)	Production (Thousand tonnes)
Andhra Pradesh	169.9	198.3
Assam	10.3	5.7
Bihar	11.4	14.1
Gujarat	14.6	13.1
Haryana	9.4	9.6
Himachal Pradesh	0.8	0.1
Jammu & Kashmir	1.0	0.4
Karnataka	151.9	46.1
Kerala	1.2	1.1
Madhya Pradesh	53.6	15.3
Maharashtra	147.6	71.9
Manipur	6.2	3.7(E)
Meghalaya	1.4	0.9
Nagaland	1.3	0.9
Orissa	47.3	38.6
Punjab	8.8	10.2(E)
Rajasthan	37.4	24.5
Tamil Nadu	62.4	32.8
Tripura	1.2	0.5
Uttar Pradesh	26.3	20.4
West Bengal	24.2	17.8
Arunachal Pradesh	0.4	0.3
Delhi	0.1	0.1
Mizoram	3.0	1.5
Pondicherry	0.1	0.1
ALL INDIA	791.8	528.0

* - Relate to 1981-82

@ - Relate to 1980-81

(E)- Estimated

The States/Union Territories not mentioned above do not grow chillies to any appreciable extent.

(Directorate of Economics and Statistics, Ministry of Agriculture, Government of India)

PRODUCTION (INDUSTRIAL)

347 Production of tomatoes in India

The estimated annual production of fresh tomatoes in India is around 1.5 million tonnes or approximately, 3% world production. The major producing states are Karnataka (27%), Uttar Pradesh (23%), Andhra Pradesh (15%), and Maharashtra (15%), which together account for 80% of production.

The current annual production of tomato products in India is approximately 6000 tonnes, consisting mainly of tomato ketchup/sauce (5000 tonnes). The production of paste/puree is confined to only four units and the quantity produced is very limited.

(PROFODCIL Bulletin 17(2); 1982; 3-11)

348 Consumer preference for edible poultry products

This project was confined to middle income group of pay range of Rs. 500 to Rs. 2000 in Madras. Egg: 96% preferred chicken egg and only 3% duck eggs. 23% preferred country eggs, 26% W.L.H. whereas 56% had no preference. 62.7% preferred white shelled eggs and 37.3% liked brown shelled eggs. Poultry meat: 89% preferred broilers and 11% bird meat. 79% preferred fresh-ment while 31% frozen meat. Frequency of purchase: once in a week 59%; once in two weeks 15%; and once in a month 36%.

(Tamil Nadu Agricultural University Newsletter 13(3); 1983; 3-4)

349 10 lakh tonne sugar quota sought

India has sought a minimum export quota of 10 lakh tonnes of sugar from the International Sugar Organisation for the year 1984. During the calender year, efforts are being made to export about seven lakh tonnes. (Business Perspective 7(10); 1983; 20)

EXPORT

350 Export of Fruits and Vegetables

Exporters of fruits, vegetables and poultry products for onward shipments via Bombay to foreign destinations from Hyderabad will now be able to avail of 70 per cent deduction in thenormal freight rates. The concessional air freight of Rs.1.30 per kg by national carriers is valid for export consignments of 250 kgs or more. The decision follows efforts by the Ministry

of Commerce to provide convenient and reasonable infrastructural facilities such as transport freight and cargo handling to help increase the exports from India. In a meeting convened under the Chairmanship of Commerce Secretary recently regarding mandatory freight rates for export of fruits and vegetables, it was explained that this sector has tremendous export potential but due to its highly perishable content, it was essential to have swift and reasonable freight facilities. It is now hoped that this concession will help further increasing the export of fruits and vegetables from the Hyderabad air cargo complex. Andhra Pradesh STC is hopeful of attracting greater exports. Similarly Indian Airlines has agreed to provide a freight rate of Rs. 3.10 per kg from Gauhati to Delhi and Rs. 3.70 per kg from Gauhati to Bombay for a minimum weight of 1000 kg. This amounts to a concession of about 68 percent of the normal freight charge. The reduction will greatly facilitate the pineapple, ginger, lime and other fruit growers of the North-Eastern region. These commodities have an excellent export potential but the earlier air freight rates were making the products costly for the processing centres located in Delhi and Bombay. Government of India has set up an agency called NERAMAC for developing production and marketing of fruits and vegetables in that region.

(*Economic and Commercial News* 13[43]; 1983; 8)

351 Export of fresh fruits and vegetables, 1980-81

	<u>Quantity</u> Kg.	<u>Amount</u> Rs.
Onion	19,36,57,751	27,67,67,981
Potato	72,18,786	1,18,35,938
Garlic	69,23,545	1,75,54,139
Shallot	95,900	5,36,082
Other alliaceous vegetables	1,63,192	7,66,141
Cabbage	3,642	8,220
Cucumber, lettuce, salad, beet	1,000	4,000
Plantain	291	1,980
Other vegetables	31,94,470	1,70,99,551
Orange	70,90,207	1,27,50,122
Lemon and Lime	43,665	2,94,586
Grape fruit	17,252	1,60,860
Citrus fruit NES	3,15,769	5,97,030
Banana	15,513	95,467

contd.

Contd.

	<u>Quantity</u> Kg.	<u>Amount</u> Rs.
Apple fresh	36,80,809	1,11,08,898
Grape fresh	5,02,898	38,11,690
Fig fresh	40	40
Coconut fresh	88,480	1,58,001
Pear quince fresh	3,53,142	3,20,352
Apricot	8,958	94,026
Peach	9,316	98,344
Plum	40,365	96,133
Sapota	52,511	2,77,446
Other stone fruit	17,736	1,12,429
Berry fresh	7,750	37,502
Pineapple fresh	2,46,091	9,73,197
Mango fresh	66,92,171	6,32,63,500
Tamarind fresh	24,65,910	1,01,18,837
Guava	18,072	1,08,162
Others	1,63,646	8,59,970
Pomegranate	24,191	92,336
Other fresh fruits	5,88,366	21,71,141

(Processed Foods Export Promotion Council Newsletter 6(7); 1983; 8-17)

352 Exports of spices from India - portwise (during the month of April 1983)

(Quantity in Metric Tons;
Value in '000 Rupees)

<u>Ports/Commodities</u>	<u>Quantity</u>	<u>Value</u>
Bombay Port		
Pepper	385.08	5,053.80
Cardamom small	8.46	1,474.73
Cardamom big	40.22	964.11
Chillies	353.75	2,575.51
Ginger	307.61	5,316.42
Turmeric	579.57	3,868.22
Curry Powder	93.87	953.68
Coriander seed	692.65	3,547.75
Cumin seed	955.17	16,076.44
Celery seed	126.15	905.20
Fennel seed	109.28	1,862.52
Fenugreek seed	216.79	1,016.74
Garlic	329.61	1,457.38
Cassia	1.50	57.00
Misc. spices	63.40	576.44
Oils of spices		79.46
Oleoresins of spices		5.50
Total	4,263.33	45,790.90

contd.

Contd.

<u>Ports/Commodities</u>	<u>Quantity</u>	<u>Value</u>
<u>Cochin Port</u>		
Pepper	4,265.65	51,473.45
Cardamom small	72.77	12,969.56
Chillies	686.74	7,569.02
Ginger	308.87	5,838.50
Turmeric	289.21	2,358.31
Curry powder	40.32	388.98
Oils of spices		909.25
Oleoresins of spices		2,770.82
Total	5,684.06	84,277.89
<u>Madras Port</u>		
Pepper	0.20	4.08
Chillies	20.30	132.22
Turmeric	35.32	274.28
Curry Powder	100.40	971.93
Coriander seed	0.40	4.32
Cumin seed	0.30	10.14
Fenugreek seed	0.10	0.59
Misc. spices	0.70	18.95
Total	157.72	1,416.51
<u>Calcutta Port</u>		
Curry powder	5.01	157.57
<u>Tuticorin port</u>		
Turmeric	2.00	7.71
Corainder seed	211.00	952.43
Cumin seed	5.00	66.04
Garlic	175.00	581.34
Total	393.00	1,607.52

(Source: Customs Lists; Provisional figures; and subject to revision)

(Spices Newsletter 17(8); 1983; 12)

353 Exports of spices from India - portwise during April-June 1983.

(Quantity in Metric Tons;
Value in '000 Rupees)

<u>Ports/Commodities</u>	<u>Quantity</u>	<u>Value</u>
<u>Bombay Port</u>		
Pepper	563.50	7,580.68
Cardamom (small)	35.61	6,081.09
Cardamom (big)	117.27	3,020.77
Dry chillies	777.69	6,324.03
Dry ginger	477.30	8,926.90
Turmeric	1,271.05	9,122.87
Curry Powder	262.12	2,970.60
Corainder seed	1,964.44	10,520.45
Cumin seed	1,588.29	26,499.97
Celery seed	429.95	3,149.48
Fennel seed	282.31	4,967.40
Fenugreek seed	618.33	3,077.97
Garlic	2,365.86	14,708.33
Cassia	137.98	1,906.36
Tejpat	1.35	8.29
Misc. spices	289.31	2,910.99
Oils of spices		243.38
Oleoresins of spices		5.50
Total	<u>11,183.31</u>	<u>1,12,025.07</u>
<u>Cochin Port</u>		
Pepper	8,031.78	98,673.56
Cardamom (small)	92.00	16,536.04
Dry chillies	1,811.09	19,406.69
Dry ginger	554.41	10,761.43
Turmeric	750.93	6,952.46
Curry powder	88.60	971.31
Corainder seed	27.74	233.44
Cumin seed	2.30	36.77
Misc. spices	0.20	2.56
Oils of spices		1,771.17
Oleoresins of spices		7,644.78
Total	<u>11,412.14</u>	<u>1,62,990.21</u>
<u>Madras Port</u>		
Pepper	2.20	38.98
Dry chillies	25.90	267.80
Turmeric	63.08	564.20
Curry Powder	255.15	2,615.39

Contd.

Contd.

<u>Ports/Commodities</u>	<u>Quantity</u>	<u>Value</u>
<u>Madras Port (contd.)</u>		
Coriander Seed	0.40	4.32
Cumin seed	0.30	10.14
Fenugreek seed	0.10	0.59
Garlic	50.00	212.50
Misc. spices	0.70	18.95
Total	<u>397.83</u>	<u>3,732.87</u>
<u>Mangalore Port</u>		
Cardamom (small)	9.00	1,701.50
<u>Calicut Port</u>		
Pepper	1.95	31.81
Dry ginger	0.15	3.89
Total	<u>2.10</u>	<u>35.70</u>
<u>Calcutta Port</u>		
Cardamom (big)	85.00	1,700.00
Curry powder	10.95	303.11
Oils of spices		41.40
Total	<u>95.96</u>	<u>2,044.51</u>
<u>Tuticorin Port</u>		
Pepper	0.10	1.75
Dry chillies	47.98	326.40
Turmeric	6.80	40.91
Coriander seed	907.30	4,328.63
Cumin seed	11.10	115.74
Fennel seed	1.10	20.77
Fenugreek seed	93.33	483.35
Garlic	368.85	1,257.03
Total	<u>1,436.56</u>	<u>6,574.58</u>

Source: Customs Daily and Weekly Lists; provisional figures; and subject to revision.

NB: Garlic and its products are now being looked after by the Processed Foods Export Promotion Council, 105, New Delhi House, 27, Barakhamba Road, New Delhi-110 001.

(Spices Newsletter 17(10); 1983; 12-13)

354 India's pepper export

Port of Export	Apr. 1981-Jan. 1982		April 1982-Jan. 1983	
	(M.Tonnes)	(Rs. '000)	(M.Tonnes)	(Rs. '000)
Bombay	444.02	7,296.77	262.49	4,570.44
Cochin	12,395.68	66,592.97	11,717.78	155,457.03
Madras	2.40	48.30	2.35	65.27
Calicut	4.55	80.68	1.60	28.31
Tuticorin	-	-	0.10	1.70
Mangalore	25.40	96.49	-	-
TOTAL	12,872.05	74,115.21	11,984.32	160,122.75

(Pepper News 7(10); 1983; 19)

355 Drop in earnings from cashew kernel exports

Exports of cashew kernels from India during the January to September 1983 registered an increase of 12 per cent at 27,013 tonnes as compared to the same period 1982. However the earnings realised were lower by 14.5 per cent at Rs.100.18 crores. This was due to the lower unit price which in the period under review averaged Rs.37.08 a kg (Rs.48.75). The average unit price realised in the same period in 1981 was Rs. 58.52.

Exports to U.S. amounted to 17,187 tonnes against a mere 3,722 tonnes last year. Japan, the second largest buyer took 1,778 tonnes as against 1,213 tonnes. Exports to Australia, Canada, the Netherlands, U.K., Federal Republic of Germany, German Democratic Republic and Singapore also were higher.

(Hindu December 18, 1983; 6)

356 Quality control for meat exports

The Commerce Ministry has announced the introduction of compulsory quality control and pre-shipment inspection in respect of export consignment of meat of buffaloes, meat of sheep and goat and introduction of quarantine for a minimum period of 21 days in respect of export consignment of live buffaloes and live sheep.

These measures are intended to ensure that only meat conforming to health standards and healthy animals are exported.

(The Hindu December 8, 1983; 7)

IMPORT

357 South Korea Liberalises imports

From July 1983, more items have been added to the list of goods which can be imported freely. The South Korean Ministry of Commerce and Industry has announced that out of 7,560 items in the eight-digit classification table, 80% will be approved automatically after July 1. The rest of the items may be imported only with approval in advance.

Among the now liberalised items for imports, cashewnut has also been included. The Indian Trade Mission in South Korea has been largely responsible in getting cashewnut included amongst the liberalised items for import into South Korea.

(Cashew Bulletin 20(7); 1983; 7)

TRADE INFORMATION

358 Trade enquiries

The following Trade Enquiries have been received by the Processed Foods Export Council from various sources for Processed Food items. Interested exporters may get in touch with the undermentioned parties. The Council, however, does not assume any responsibility for their financial standing and business integrity.

<u>Name of Importer</u>	<u>Items of Interest</u>
Victory Company for Free Trade, Steamer Point, Aden (PDRY)	Mango juice
Original San Diego Fudgery, 13330, Paseo del Verano Morte, San Diego, California-92128	Indian Sweets
Mahmoud & Abbas Hassan Company, P.O.Box No.25448, Safat, Kuwait	All kinds of processed foods
Jayaar Impex Limited, 124, Malvern Gardens, Harrow, Middlesex HA3 9PG	Fruit and Vegetables Canned Vegetables Canned Green Pepper

Contd.

Arabian Hawk Trading & Civil
Contracting Est.,
P.O.Box No.26408, Safat,
Kuwait

Blue Bird Confectionery Holding
Limited,
Hunnington, Halesowen,
West Midlands B 62 OBN

Al Awadi Import & Export Bureau,
P.O.Box No.11297, Dasmah,
Kuwait.

Tozai Tsusho Co. Ltd.,
Fuji Building,
10-8, Sotokanda, 2-Chome, Chiyoda-ku,
Tokyo, Japan.

Ali Abdullah Al-Amoundi,
King Faisal Street, Mecca,
Saudi Arabia.

C.M.Galunggung,
Jalan Gadah No.21 B-C,
Medan, Indonesia

Rice, Canned food products

Walnuts

Canned and Bottled Foods &
Beverages

Tamarind

Canned Vegetables,
Canned fruit juicesMangoes,
Pineapple (Tinned)

(Profodcil Bulletin 17(4); 1983; 32)

359 Trade Enquiries

Almokbel, B.P.
P.O.Box No.2209,
Siege Social Place, Mahmoud Harbi,
Republic of Djibouti.
Phone: 353078 Cable: MOKBEL

Tahany Corporation, P.O.Box No.1057,
Jeddah, Saudi Arabia, TAHANYSJ
Telex: 400388

C.L. DE Castro E Abreu, LDA
Av. Infante Santo, 352,
1300 Lisbon.

M/s Armeco SA,
P.O.Box 231,
CH-1211, Geneva-17

Windsor Commodities SA,
5 Quai de l'Île,
CH-1211 Geneva-11

Delamain & Co.
Rue J & R Delamain
P.O.Box No.16
16200 Jarnac (France)

Canned mango juices, biscuit

Onions, potatoes and garlic.

Potatoes.

Canned foods.

Canned foods.

Alcoholic drinks.

Contd.

Contd.

Genset International,
555, East Coast Road,
Singapore-15.

Food products.

M/s. King Siang Hing Tan Kee,
6, Duke Road, Singapore-10.

Fresh Fruits.

Mr. Zakir Sameja,
P.O.Box 10253, Nairobi, Kenya.

Jaggery.

Golden Gate Enterprises,
P.O.Box No. 6671,
Dammam, Saudi Arabia
Phone: 6332365 Telex: 060 46

Food stuffs.

Al-Moussawi & Partners W.L.L.
P.O. Box No. 23855,
Safat Kuwait.

Foodstuffs.

Al-Merry Construction,
Conf. & Trading Est.,
P.O.Box No.19064,
Khitan, Kuwait,
Phones: 739430 & 719319

Foodstuffs.

(Processed Foods Export Promotion Council Newsletter 6(7); 1983; 31)

FOOD REGULATION, QUALITY CONTROL AND HYGIENE

REGULATION

360 Use of the term 'imitation'

FDA has denied a petition submitted by the National Milk Producers Federation to broaden the circumstances under which the use of the term "imitation" would be required. FDA, after reviewing the petition, comments and consumer surveys; concluded that the current regulation - which states that a food which resembles and substitutes for another food must bear the term "imitation" if it is nutritionally inferior to that food - provides a suitable degree of flexibility in labelling. Details are in the Federal Register of Aug. 19.

(Food Technology 37(10); 1983; 55)

361 Use of sucrose fatty acid esters

FDA is allowing use of sucrose fatty acid esters (1) as emulsifiers, stabilizers, and texturizers in baked goods and baking mixes, biscuit mixes, dairy product analogs, frozen dairy desserts and mixes, and whipped milk

products, in response to a petition by the Nebraska Dept. of Economic Development, and (2) as components of protective coatings on pineapples, in response to a petition by TAL Chemicals Co. Details are in the Federal Register of Aug. 23.

(*Food Technology* 37(10); 1983; 56)

362 Canada's proposed definition of 'natural' foods

Canada's Bureau of Consumer Affairs is proposing to define a "natural" food as "one which has undergone or has been submitted to a minimum of processing and which has undergone a minimum of physical, chemical or biological change before reaching its present state". The proposed guidelines state that a natural food or ingredients should not contain or have evern contained any amount of added ingredient, component, or constituent regarded as: a food additive, including colouring agents and preservatives other than compounds which meet these guidelines; a vitamin or mineral nutrient; an artificial flavouring agent; or a pesticide, insecticide, herbicide, or other agricultural chemical, if the product is also claimed to be "organically grown" or "organic". Thus, products containing added vitamins, minerals, salt, vinegar, or sugar cannot be described as natural, but products which have been subjected to or come in contact with processing aids, pesticides, insecticides, fertilizers, growth regulators, or other chemicals, could be described as natural if they otherwise meet the guidelines.

(*Food Technology* 37(9); 1983; 21)

363 Kuwait brings in new regulations

Regulations on labelling imported foods have been agreed by the Municipality and the commerce, and industry and public health ministries. The manufacturer must specify the date of manufacture, expiry date, contents and commercial date.

(*Cardamom* 15(10); 1983; 17)

364 Exchange rules to be simplified

The Reserve Bank of India has constituted a 9-member committee to suggest means towards simplifying and steamlining the foreign exchange control regulations of exports and imports. The committee would review the exchange control regulations relating to allied issues such as establishment of offices by Indian firms abroad, payment of commission to trade representa-

tives, remittance of royalties, licence fees, deputation of Indian personnel abroad and foreign export services.

It would also revise the present system of delegation of powers to authorised dealers in foreign exchange and the scope for further decentralisation of the RBI's exchange control department to its Regional Offices. (*Spices Newsletter* 17(8); 1983; 8)

365 Adopts new method to confirm aflatoxin

FDA has issued a new Compliance Policy Guide 7 120.26 that now requires that the presence of aflatoxin B₁ in certain foods be confirmed by negative ion chemical ionization mass spectrometry, which takes only a few hours, instead of by the chick embryo bioassay; which takes at least three weeks. Details are in the Federal Register of April 5. (*Food Technology* 37(6); 1983; 41)

366 Allows polymeric antioxidant in foods

The Food and Drug Administration is allowing use of the non absorbable polymeric antioxidant anoxomer as the direct human food additive, as proposed by Dynapol. Details are in the DFederal Register of April 26. (*Food Technology* 37(6); 1983; 41)

367 Prevention of Food Adulteration (Sixth Amendment) Rules, 1983

G.S.R. 803 (E) - Whereas certain draft rules further to amend the Prevention of Food Adulteration Rules, 1955 were published as required by sub-section (1) of section 23 of the Prevention of Food Adulteration Act 1954 (37 of 1954) with the notification of the Government of India in the Ministry of Health and Family Welfare (Department of Health) No.GSR 269, dated the 23rd February, 1980, and subsequently republished with the notifications of the Government of India in the Ministry of Health and Family Welfare (Department of Health) No. GSR 1057; dated the 23rd September 1980 and No. GSR 490, dated the 14th May 1982 respectively of the Gazette of India, Part II, Section 3, Sub-Section (i) dated the 23rd February 1980, 23rd September 1980 and 14th May 1982, inviting objections and suggestions from all persons likely to be affected thereby before the expiry of ninety days from the date on which copies of the official Gazette in which the last mentioned notification was published were made available to the public;

And whereas the copies of the said Gazette were made available to the public on the 29th May 1982;

And whereas the objections and suggestions received from the public on the said draft rules have been considered by the Central Government;

Now, therefore, in exercise of the powers conferred by sub-section (1) of section 23 of the said Act, the Central Government after consultation with the Central Committee for Food Standards, hereby makes the following rules further to amend the Prevention of Food Adulteration Rules, 1955, namely:-

RULES

1.(1) These rules may be called the Prevention of Food Adulteration (Sixth Amendment) Rules, 1983.

(2) They shall come into the force on the date of their publication in the Official Gazette.

2. In the Prevention of Food Adulteration Rules 1955, in Appendix 'B', --

(a) for item A, 05.07, the following item shall be substituted, namely:

"A. 05.07 -- Cloves (Laung) whole means the dried, unopened flower buds of *Eugenia Caryophyllus* (C. sprengel) Bullock and Harrison. The inorganic extraneous matter shall not exceed 0.5 per cent by weight and the organic extraneous matter, which includes vegetable matter of plants other than cloves, tendril cloves (peduncle), mother cloves or other matters of plants of cloves, shall not exceed two per cent by weight. (Headless cloves shall not be considered as extraneous matter). The amount of insect damaged clove shall not exceed 1.0 per cent by weight.

The cloves (on dry basis) shall contain not less than 15.0 per cent (v/w) of volatile oil. It shall be free from added colouring matter.

EXPLANATION:

- (i) The term "insect damaged clove" means the cloves that are partially or wholly bored by insects.
- (ii) The term "headless cloves" means cloves constituted only by the receptacle and sepals.
- (iii) in item A.05.07.01, for the words "*Eugenia carryophyllate thumb*", the words and brackets, "*Eugenia carryphyllus* (C. Sprengel) Bullock and Harrison" shall be substituted.

(c) in note (2) occurring after item A.05.23, the letter and figures "A.05.07" shall be omitted.

(Gazette of India (Extraordinary) Part II, Section 3, sub-section (i);
March 26, 1983; 4-5)

368 Prevention of Food Adulteration (Seventh Amendment) Rules, 1983

G.S.R. 816(E) -- Whereas certain draft rules further to amend the Prevention of Food Adulteration Rules, 1955 were published as required by sub-section (1) of section 23 of the Prevention of Food Adulteration Act 1954 (37 of 1954), with the notification of the Government of India in the Ministry of Health and Family Welfare (Department of Health) No. G.S.R. 760(E), dated 17th December, 1982 at pages 1 to 2 of the Gazette of India Extraordinary Part II Section 3, sub-section (i) dated the 17th December, 1982 for inviting objections and suggestions from all persons likely to be affected thereby before the expiry of forty five days from the date on which the copies of the Official Gazette in which the said notification was published were made available to the public;

And whereas the copies of the said Gazette were made available to the public on 28th December, 1982;

And whereas the objections and suggestions received from the public on the said draft rules have been considered by the Central Government.

Now, therefore, in exercise of the powers conferred by sub-section (1) of section 23 of the said Act, the Central Government after consultation with the Central Committee for Food Standards, hereby makes the following rules further to amend the Prevention of Food Adulteration Rules, 1955, namely:

RULES

1. (1) These rules may be called Prevention of Food Adulteration (Seventh Amendment) Rules, 1983.

(2) They shall come into the force on the date of their publication in the Official Gazette.

2. In the Prevention of Food Adulteration Rules, 1955, in Appendix B,-

(i) in item A, 07.04 for the words and figures, "which may contain the permitted Flavours, sugar, syrup, fruit, fruit juices, cocoa, citric acid, stabilizers or emulsifiers not exceeding 0.5 per cent by weight", the following shall be substituted namely:-

"which may contain sugar, syrup, fruit, fruit juices, cocoa, citric acid, permitted flavours and colours. It may also contain permitted stabilizers and/or emulsifiers not exceeding 0.5 per cent by weight".

(ii) in item A.07.04.01 for the words and figures, "which may contain permitted flavour, fruit, fruit juices, nuts, cocoa, citric acid, stabilizers or emulsifiers not exceeding 0.5 per cent", the following shall be substituted, namely:-

"which may contain fruit, fruit juices, cocoa, nuts, citric acid, permitted flavours and colours. It may also contain permitted stabilizers and/or emulsifiers not exceeding 0.5 per cent by weight".

(iii) in item A.14, in clause (a), the words "on dry basis", occurring at the end, shall be omitted:

(iv) in item A.14.01, for the entry, "5.0 to 8.0 per cent by weight on dry basis", the following shall be substituted, namely:-

"4.5 to 9.0 per cent by weight".

(Gazette of India, Part II, Section 3, subsection (i); November 3, 1983; 3-4)

HYGIENE

369 Aflatoxin - a cause for Kwashiorkor

Kwashiorkor, a condition that kills many millions of infants in the tropical Third World has always been believed to be caused simply by a diet deficient in protein. But scientists have just discovered that it may be caused by aflatoxin, a poison produced by the fungus *Aspergillus flavus* which grows on many crops stored in hot humid conditions. Aflatoxin causes liver damage and is suspected to cause liver cancer. If it is proved to cause kwashiorkor too, then it follows that the most widely-used treatment for kwashiorkor, supplementation of the diet with protein will do more harm than good. But it also means that kwashiorkor can be reduced or even eliminated by simple campaigns to improve the storage of crops and, perhaps, by the development of vaccines to protect against the harmful effects of aflatoxin. Looking for this peculiarity, Hendrickse noted that kwashiorkor occurs commonly in hot and humid areas but never in hot dry areas, for example in south-east but not in south-west Africa. Kwashiorkor flourishes

especially in the wet season, suggesting a further link with damp conditions, but its symptoms are never found in victims of protein malnutrition in temperate areas.

(*League for International Food Education Newsletter* 16(1); 1983; 2)

370 Micro-clean adhesive mats

When placed at the entrance of critical industrial areas such as clean rooms, laboratories, packaging and processing areas, and other environments, these mats from Canlab intercept dirt and other particulate matter to dramatically reduce contamination. The Micro-Clean Mat is composed of 20 layers (46 x 114 cm) of tough, thin polyethylene film laminated together into a stack only 1.5 mm thick. Each layer of film is coated with a unique hightack adhesive, made glass smooth to assure full area contact and the most efficient dirt removal. When mat surface is contaminated, simply peel off top layer to expose a clean fresh surface.

(*Food in Canada* 42(3); 1983; 35)

371 Mechanical dishwashing

An innovative, low temperature system for mechanical dishwashing has been introduced in the UK by Lever Industrial. Called the Leverclean Low Temperature Mechanical Dishwashing System, it provides significant energy savings. At the same time, it safeguards hygiene, betters the washing conditions for staff and can improve wash results. Mechanical dishwashing accounts for up to half of all the energy used in a kitchen. By operating at wash and rinse temperatures considerably below conventional levels, the Leverclean system saves up to 30 per cent of the energy used. It is particularly suited to larger dishwashers such as multi-tank and flite-type machines, where the most substantial washings are made. Existing machines are readily converted to give immediate benefits and no capital cost is involved.

The system is based on three new liquid products which have been successfully developed to perform efficiently at the reduced temperatures. These are a detergent, a rinse aid and a sanitiser. The detergent, Sumazon EF, will remove even the most difficult soils such as starch and dried-on egg. The rinse aid, Sumabrite E, promotes rapid, streak-free drying and it also contains an ingredient to prevent foaming problems which are otherwise likely to occur at low wash temperatures.

The third product essential to the systems is Sumazon EH, the sanitiser. This not only gives the hygiene protection normally obtained by high temperature dishwashing, it also has the added advantage of significantly reducing the risk of bacteriological cross infection, providing improved hygiene security. All three products are automatically dosed into the machine using the Sumatic E dosing equipment which is installed free-on-loan. After taking into account the cost of the special products, most operators converting to the Leverclean low temperature system can expect to achieve a net saving of at least 10 per cent in their additional operating costs for dishwashing.

Additional advantages include the system's ability to aid tannin stain removal as the sanitiser is hypochlorite based. By making the dishwashing environment cooler and less humid, the Leverclean system creates a more pleasant and productive climate in which to work.

(*Food and Cookery Review* 50(1); 1983; 4)

TRANSFER OF TECHNOLOGY AND NEW INDUSTRIES

372 Information dissemination by public sector units

The industry ministry has directed all the public sector undertakings to institutionalise a mechanism in their overseas offices to ensure a free flow of commercial and technical information for the benefit of domestic industry. If certain information is not useful for the public sector companies it may be communicated to specific companies in private sector. Under the plan, overseas offices of one public sector company will be required to send all the tender notices from the country of its operation. Such an office will also keep a close watch on technology - both existing and newly developed - which could be of use to India. The public sector unit receiving such information will have to transmit the same to the DGTD which in turn will circulate it to different private companies.

(*Business Perspective* 7(9); 1983; 21-22)

373 Aid develops new program to help local food industries

Food companies in developing countries will have access to the know-how of major U.S. corporations under an innovative program being launched by the Agency for International Development (AID). Called Project SUSTAIN-Sharing U.S. Technology to Aid in the Improvement of Nutrition -- the program will make it possible for local companies and industries to call on technical experts employed by the U.S. food industry to help them prevent food losses, ensure food safety, promote quality control, and enhance the nutritional value of the foodstuffs they produce.

This assistance may take a number of forms. The U.S. companies can:

- Provide short-term technical help that addresses specific problems of a single company in a single country. (Note the emphasis on short-term help; the U.S. companies obviously cannot spare their technical people for extended periods.)
- Train the staff of a single company in a technology that is new to them.
- Train personnel of a single company at the facilities of U.S. companies.
- Train persons from many companies in one country or from several countries in one region in technologies new to them.
- Conduct training in the U.S. for groups of persons.

Under the program, local companies can request assistance on such diverse matters as:

- Designing a food processing system
- Solving a particular processing problem
- Implementing fortification programs
- Determining the kind of equipment needed for a particular process
- Locating new or used equipment
- Selecting a packaging technology
- Controlling rodents, insects, and other vermin in processing plants
- Establishing a quality control program.

Project SUSTAIN is a cooperative enterprise in which local private industries, participating U.S. companies, and AID all have distinct responsibilities. Local companies requesting assistance will (1) prepare clear, specific descriptions of the tasks to be performed; (2) be hosts to, and supervise, the consultants; and (3) bear their in-country costs (per diem, secretarial assistance, local travel, etc.). The U.S. corporations will provide the technical experts and pay their salaries. AID will (1) screen requests for assistance; (2) invite responses from appropriate U.S.

companies; and (3) arrange and pay for the international travel of the consultants.

The list of participating corporations already includes such giants of the U.S. food industry as Dart & Kraft, Del Monte, General Mills, Gerber Products, Kellogg, McCormick, Pillsbury, Quaker Oats, Ralston Purina, and Roman Meal. It is expected that others will join in the effort as the program develops.

Interested local companies should get in touch with their USAID missions, or write to: Project SUSTAIN; c/o Office of Nutrition (S&T/N); US Agency for International Development; Washington, DC 20523 USA.
(League for International Food Education Newsletter 16(1); 1983; 4)

374 Awards for small-scale industries

The Government of India has instituted national awards-for outstanding entrepreneurs setting up small-scale industries. The first three awards will carry a cash award of Rs. 25,000, Rs. 20,000 and Rs. 15,000. Additionally, a special recognition award of Rs. 10,000 would be conferred on entrepreneurs from each State and Union Territory.

The awards for 1982 would be given in 1983 and entrepreneurs who set up their enterprises during the preceding five calendar years and were registered with the State Directorate of Industries would be considered eligible for the special recognition award.

(Spices Newsletter 17(8); 1983; 8)

375 New facilities for S.S.I. units

To give proper attention towards developing and sustaining small scale industrial units, the Ministry of Finance, Government of India has recently extended the following facilities to the SSI units: (a) Earnest money/security deposit need not be taken from the small scale/registered with public units/enterprises concerned with National Small Industries Corporation, (b) Tender sets may be given free of cost to small scale units registered with public sector enterprises concerned or with the National Small Industries Corporation.

(Spices Newsletter 17(10); 1983; 10)

376 More items reserved for small units

The Government has reserved 34 more industrial items for production in the small scale sector. The new items in the list include tapioca sago, tapioca flour, calcium nitrate (except as a by-product) man-made fibre hosiery, injection moulding thermo-plastic products.

(Business Perspective 7(10); 1983; 16)

377 Research in Japan funded by industry

Nearly two thirds of all scientific research in Japan is funded by industry and only a third by Government. While industry provides 65.9 per cent of the total research funds, the Japanese Government aids to the extent of 29.7 per cent.

One consequence is that Industry is particularly concerned with obtaining adequate returns on its investment and ensures that research is relevant to the marketable products. Japan now spends the equivalent of over US \$ 24 billion annually on scientific research and development - a tenth of the world total. Japan's expenditure on R&D is about 2.2 per cent of its GNP, the same figure as that of other industrialized nations like the United States and Britain.

(Industrial Herald Weekly 18(46); 1983; 15)

378 Commercial manufacture of iodised salt

With a view to ensuring easy availability of iodised salt, Government of India has decided to allow its commercial manufacture. The persons intending to manufacture iodised salt are required to register with the Salt Commissioner, Government of India, Jaipur. Iodised salt can be produced either by adopting the mechanical spray process or the submersion process. The necessary technical know-how and erection details of the submersion process can be obtained from the National Research Development Corporation or Central Salt and Marine Chemical Research Institute, Bhavnagar. The salt used for iodisation should contain a minimum of 96 per cent sodium chloride and the iodised salt should conform to the standard prescribed under the Prevention of Food Adulteration Act, 1954. It should contain 25 ppm of potassium iodate or such other level as may be prescribed by the Ministry of Health and Family Welfare, when it is offered for sale for human consumption in the goitre endemic areas. The unit can go into commercial production.

only after the plants are inspected by the Salt Commissioner. The manufacturer is required to make necessary arrangements for process control and on-the-spot analysis of iodised salt for its iodine content.

The iodised salt is required to be packed preferably in polythene lined jute bags or HDPE bags. The packing should indicate the name of the producer, date of production and batch number, iodate content and net weight. The iodised salt shall be offered for sale only in such markets as the Salt Commissioner may allot to the manufacturers. He will also grant wagon quota under category 'B' for the movement of iodised salt through goitre endemic areas.

(Economic and Commercial News 13(40); 1983; 10)

379 Apple knowhow

Australia will provide technical expertise for another four years to boost production of quality apples in Jammu and Kashmir through the application of improved techniques. A memorandum of understanding to this effect was signed here today to formalise the Indo-Australian apple technology extension project. It is a continuation of the apple grading and storage project, under which a model pack house-cool store was established to introduce and demonstrate modern methods of grading, sizing, packaging, storage and marketing of apples. The Australian contribution to the project was about Rs. 81 lakhs.

(Hindu September 22, 1983, 16)

380 New industries

Kerala State Industrial Development Corporation is looking for entrepreneurs interested in investing in any of the following projects:

1. Project for Refining Coconut oil: Plant for 6,000 tonnes per annum which will cost about Rs. 80 lakhs and will have a turnover of about Rs.1225 lakhs with a profit of Rs. 75 lakhs.

2. Project for Manufacture of Cocoa Butter Equivalent: Project for 5000 tonnes per annum which will cost about Rs. 300 lakhs with a turnover of Rs. 1200 lakhs and profit of Rs. 90 lakhs.

3. Project for Refined Rice Bran oil: Production facility for 10,000 tonnes per annum which will have a cost of about 700 lakhs, turnover of about 1,575 lakhs and profit of 100 lakhs.

4. Project for Manufacture of Protein Isolates: Project for the manufacture of Protein isolates from groundnut cake after groundnut oil has been extracted. Such a project for 1,500 tonnes per annum will cost about Rs. 130 lakhs with a turnover a Rs. 270 lakhs and profit of Rs. 30 lakhs.

5. Project for Tuna Fishing, Canning and Export.

6. Project for Shrimp Farming.

(PFNDAI Newsletter No. 39; 1983)

381 Beta-carotene from algae

Beta-carotene Industries Ltd., of Perth, Western Australia, is to build a \$A4.5 million plant to recover 300 tonnes a year of beta-carotene from algae.

It is believed the product will compete with the synthetic version.

The plant will also produce high protein meal and glycerine.

(*Food Technology in New Zealand* 17(7); 1982; 11)

382 R.B.I. renames its credit department

The Industrial Credit Department of the Research Bank has been renamed as the Industrial and Export Credit Department. Besides handling the work connected with the credit authorisation scheme, sick industrial units and liaison and operational work connected with institutional finance, the Department also deals with the various aspects of export finance and administers the export credit interest subsidy and duty drawback credit schemes.

(*Cardamom* 15(10); 1983; 18)

PERSONALIA

Nil

